Six Lectures

ON

SYPHILITIC INFECTION

AND

SYPHILISATION,

DELIVERED AT

THE LOCK HOSPITAL, LONDON.

BY

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ON

VENEREAL DISEASES.

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CONTENTS.

LECTURES, DELIVERED AT THE LOCK HOSPITAL, LONDON.

LECTURE I.

Gentlemen:—We are met to-day for the first time in this hospital, by the special permission of the Board of Governors, to whom we are indebted for having placed the board-room at our disposal for the purpose of these lectures.

Among the patients admitted on the last taking-in day, are three cases of syphilitic infection, to which I wish to direct your attention. These three cases, which we have just seen, are interesting, as presenting the common and well marked characters of three very different and distinct results of syphilitic contagion. Although the effect of a common poison, they offer some very marked points of contrast in their mode of origin, in the local actions to which the poison gives rise in parts not themselves primarily affected, and in the influence produced upon the general system. They differ no less in the treatment which has been pursued, and which has been based upon the consideration of the different morbid process which has been induced in each. I am the more anxious to enter into a full investigation of the diseased actions which have taken place in these instances, not so much on account of the features of interest which they individually present, as because each of them may be considered as typical of a large class of cases, distinct in their essential characteristics, and presenting themselves daily in practice. I conceive that the study of such diseases is likely to be much more profitable, at least

to the younger part of my audience, than the investigation of any of the more rare and uncommon forms of venereal affections.

The patients, to whose cases I am directing your attention, are all young, and bear every indication of not having before suffered from disease: we have, therefore, the advantage of studying the symptoms as they arise directly from the application of the syphilitic poison, uncomplicated by other affections.

The first case to which I will allude is that of a young married woman, E. F., who was confined seven months ago. When she had recovered, she took the place of a wet nurse; and, during her absence, her husband became diseased, and was treated for primary syphilis at this hospital. Having returned home, she found, four months ago, a sore place upon the left labium. This remained open for six weeks. At this time, she took some mercury pills, and was under treatment for three weeks; but her mouth was affected for two or three days only. During the existence of the primary disease, the inguinal glands were slightly enlarged, but not inflamed. Two months ago, an eruption appeared, which soon covered her whole body. Upon her admission into the hospital, the eruption was very fully developed: it consisted of circular elevated patches, of a deep copper colour, and desquamating upon their surface. The left eye was much injected, the pupil dilated, and the sight impaired. The cicatrix of the primary sore still presented some induration. The inguinal glands were slightly enlarged; they were not tender to the touch, rolled freely under the finger, and had remained in much the same condition since the existence of the primary disease.

This patient was admitted on the 27th of October and, on the 28th, she was ordered four grains of blue pill, and half a grain of opium, three times a day; and already has she considerably improved under this treatment. The sight of the eye has returned; the pupil is now the same size as that of the opposite side; and the colour of the eruption is less strongly marked.

The traces left by the primary disease in this case show that it had its origin in a sore, surrounded by specific adhesive inflammation. From the character of the induration still remaining at the seat of the ulcer, there can be little doubt that it was of the class so well described by Hunter, and which, up to the present day, bears his name.

The inguinal glands in this case present the condition usually observed in conjunction with indurated sores: they afford the sensation of small circumscribed oval or almond shaped bodies, perfectly distinct from each other, unaccompanied by any redness of the skin, which moves freely over the surface. It often happens that one such gland alone can be felt. The existence of these enlarged glands tends to confirm the opinion of the nature of the disease; but they cannot in themselves be at all relied upon as a means of diagnosis. They may be enlarged in a similar manner, after any cause which gives rise to adhesive inflammation in the parts to which the lymphatics are distributed. There is, however, this peculiarity in the enlarged glands which accompany an indurated syphilitic sore; namely, that, as the adhesive inflammation which results from the syphilitic inoculation is of a chronic character, and in general lasts for a considerable time, so the corresponding affection of the glands is likely to last much longer than when it arises from other causes; but, during the time that it does last, an enlarged gland which accompanies common adhesive inflammation presents no characters by which it can, with any degree of certainty, be distinguished from one which, in a similar way, accompanies a specific sore. In either case, an altered condition in the action of the inflamed parts is accompanied by a corresponding alteration in the action of the absorbent glands. This action appears to imply increased activity in the functions of the gland, corresponding with the increased activity at the seat of the adhesive inflammation; and as, in the latter case, the increased action is indicated by a thickening of the parts, so in the former is it indicated by an enlargement of the gland.

From what I have now said, it will appear that I do not regard the kind of enlargement of the lymphatic glands to which I have alluded as in any way dependent upon the absorption of the syphilitic poison; and we have good ground for believing that no absorption of syphilitic matter by the absorbents takes place in these cases. The common effect of the introduction of syphilitic matter into a part is, as you well know, the production in that part of a peculiar and specific inflammation. This inflammation, after going through various stages, terminates in suppuration within a week. This has been proved to be the usual course of things by experiments, by means of artificial inoculation, which have been varied in many ways, and repeated a very

great number of times. If, therefore, any syphilitic matter were absorbed as such from the surface of an indurated chancre, we should reasonably expect that it would produce its specific effects, terminating in suppuration in the inguinal glands to which it is conveyed. Now, the observation of a very large number of cases enables me to say that no such suppuration takes place in the cases to which I am referring. The specific action which is induced in cases of indurated sores is not accompanied by a suppurating bubo. This proposition I believe to be true in its widest sense; but it does not of course follow that other causes may not produce a suppurating bubo in patients affected with a specific indurated sore. If the parts should be irritated by the application of caustic, or if the patient should happen to be of a scrofulous habit, then one or more inguinal glands may very likely suppurate; but so they would in a similiar proportion of cases, under the same circumstances, where no venereal infection had taken place. There is a patient now under my care at King's College Hospital, who offers an apparent exception to the law which I have mentioned. This patient has an indurated sore upon the left side of the penis, and a suppurating bubo in the right groin. When I first saw this case, I thought that it afforded a well marked exception to the general rule; but, upon a more careful examination, a superficial ulceration presented itself beneath the prepuce on the right side, which at once accounted for the suppurating bubo in the right groin. The glands in the left groin, on the side of the indurated sore, are, in this instance, in the same condition as those in the first case above related. Whenever suppuration of an inguinal gland does occur in conjunction with an indurated sore, it will, I believe, be found to depend upon some accidental cause such as I have mentioned; and the non-occurrence of suppuration in any other cases affords very strong evidence that the absorption of the syphilitic virus, as such, is not the cause of the enlargement of glands which accompanies indurated syphilitic sores. But, as this is a somewhat novel doctrine, the evidence of direct experiment would probably be more satisfactory to some than the conclusions drawn from the observation of cases. This evidence I lately had the opportunity of affording in a case that fell under my care at King's College Hospital. A patient, thirty-two years of age, applied on the 17th of October, with a large circular

and indurated ulcer on the finger. It had existed, he stated, for four months, and was considerably larger than a shilling. Some well marked syphilitic spots were appearing on his forehead and shoulders. He had never before had any similar disease, and had contracted his present affection, having exposed himself to contagion, after having burnt his finger with some quick lime. On the arm, above the elbow, and immediately on the inside of the biceps musele, was an enlarged gland, over which the skin could be moved freely. There was a second smaller gland in the axilla. In front of the biceps were two very small rounded masses, probably enlarged lymphatic vessels. On the 19th of October, a fine needle was introduced nearly through the largest gland on the inside of the arm. Had the gland contained any inoculable fluid, we must suppose that some of this would have been led out, and that it would have contaminated the surrounding parts. The patient was now admitted into King's College Hospital, where some of you had the opportunity of seeing him. On the 21st, two days after the puncture, no result had appeared from the experiment; and, on the 24th, there was still no result; nor has any appeared since that time.

As far as this experiment goes, it tends to prove that which was before deduced from clinical observation; viz., that the chronic enlargement of the inguinal glands, which accompanies an indurated chancre, does not depend upon the presence in those glands of any inoculable matter. The syphilitic poison cannot be traced, as such, in the class of cases which we have been considering, through the absorbent system, even to the first lymphatic gland which it would meet with in its course.

The second case to which I wish to draw your attention is that of a patient, E. T., only sixteen years of age. In this instance, the first symptom perceived was an enlargement of the inguinal glands upon the right side. Even up to the time of her admission into the hospital, she was not aware of the existence of any other disease. The enlargement of the glands soon increased, became painful and inflamed, gradually involving the surrounding parts, and terminated, within a fortnight of its first appearance, in suppuration.

Upon carefully examining this patient, an irregular ragged ulceration was discovered immediately within the orifice of the vagina. This was painful, affording appa-

rently an abundant secretion, and situated upon the side corresponding to the open bubo. Upon her admission, the bubo was much inflamed, with undermined and livid edges, and afforded a copious discoloured secretion. Bark, nitric acid, and opium, were ordered; and the ulceration was dressed with a stimulating ointment.

This case affords a direct contrast to the one first mentioned. There the primary ulcer was indurated; here it is unindurated, inflamed, and ragged. There the enlargement of the inguinal glands was scarcely perceptible without a careful examination; here it forms the great feature of the complaint. In the first case, the patient was treated with mercury; here she is treated with tonics. Any one carefully considering these differences for the first time might surely say, "Why! these are two different diseases. They cannot depend upon the same morbid poison." And this view has actually been entertained by surgeons of very great eminence, and is regarded by some surgeons even of the present day as the only way of accounting for the difference observable in different cases of syphilitic infection. The difference, however, consists not in the kind of poison, but in the kind of morbid process to which that poison gives rise in different instances. In the one case, the infected part becomes callous and indurated, exuding from its surface a thin serous fluid during its early stages, and at no period furnishing a free secretion of well formed pus until it has lost its specific character—until, in fact, it is undergoing the process of repair. Up to this time, the actions in the part are very sluggish; the appearance of the surface of the wound may undergo changes in colour, depending upon the appearance or disappearance of successive crops of granulations; but the specific and peculiar induration, so characteristic of this form of disease, remains for days, and sometimes for weeks, without any very apparent alteration. Now, this infected part has to be nourished, in common with every other part of the body. The blood is constantly circulating through it. The parts of which it is composed are acted upon in common with other living structures. Some particles, we cannot but suppose, are being removed, and are being replaced by others, in the process of nutrition. The peculiar action produced by this disease has its effect upon neighbouring parts, apparently in a state of health, as is demonstrated by the diseased actions which are set up in those parts, wherever

the original disease is removed by caustic or excision. When these morbid processes are continued in an infected part for days or weeks together, we cannot be surprised that the whole system should ultimately become affected with the poison, as we have seen has happened in the first instance which I have related.

In the other case, the changes produced in the inoculated part are much more rapid; we have not the same condition of parts upon the first appearance of the disease, for two days in succession. The ulceration rapidly increases. It is surrounded by more or less inflammation, and the parts are generally painful. The surface of the sore presents an irregular and ragged appearance, as though it had been eaten away; the parts, of which it is composed, are in a state of continual change, the surface which may be seen one day has disappeared or is disappearing the next; fresh parts occupy its place, which, in their turn, disappear in a similar manner. During the time that this action is going on at the seat of the primary disease, the glands in the groin, upon the affected side, will become painful, and the patient will complain of feeling stiff upon that side. In a day or two, the glands will be enlarged, and the pain will have increased. The skin covering them will then become red; and they now can no longer be distinguished as separate tumours, because the surrounding parts have become involved in the thickening. Within a few days from the first appearance of the swelling in the groin, the skin covering it will have assumed a deep red colour, which gradually fades into the colour of the surrounding parts. The inflamed structures are excessively painful, and remain so until the inflammation terminates in suppuration. The pus which first forms, or, at least, which first presents itself—which first *points*, is usually derived from the cellular tissue around the affected glands. This pus possesses no specific qualities; it cannot be inoculated so as to produce a syphilitic ulcer upon another part. But there is a fluid more or less puriform in character, which is derived from the affected glands themselves; this may, with tolerable certainty, be inoculated, and it will give rise to a characteristic pustule, identical in appearance to that which would be produced by inoculating the secretion from the surface of a common syphilitic ulcer. These two fluids, so different in their actions, can only be distinguished at the time when suppuration is first established. As soon

as the matter within the gland becomes discharged, it mixes with the pus from the surrounding parts, and often renders the whole capable of being inoculated, and consequently the whole surface, exposed, becomes a syphilitic ulcer.

In the process which I have now described, the absorbent play a very prominent part. The action is that of ulceration, properly so called; and we have the proof of direct experiment, that the syphilitic virus is taken up, as such, with the other materials absorbed by the lymphatics. This activity of the absorbents it is, which gives to the surface of the primary ulcer its peculiar, ragged, and irregular appearance. In this respect it is, that this class of cases affords so marked a contrast to that which was first noticed. In that, as far as the evidence of direct experiment went, we had reason to believe that no inoculable matter was absorbed; and practically we find, that in those cases, the buboes do not suppurate. In this, we find that inoculable matter is absorbed, and that the buboes, as a rule, do suppurate. But there is another and still more important point of difference between the two classes of cases; one so important, and of such direct practical application, that I have reserved it for separate consideration. The stationary indurated sore will, as I have said, in the ordinary course of things, be followed by general syphilitic infection: the sore which runs rapidly into ulceration, whose surface is constantly being removed in the manner which I have mentioned, will, as a very general rule, not be followed by any constitutional disease. This law I am enabled with much confidence to state, from the observation of a great number of cases. For a long time, I have directed the attention of gentlemen to the fact, both here and at King's College Hospital, and we have not met with any cases which would lead us to suspect the correctness of the general inference. It may, I believe, be laid down as a practical guide, whenever we have the evidence afforded by a suppurating bubo, that a primary sore has, from the first, taken on an ulcerative action, that no secondary symptoms will appear; and therefore, as we have had this evidence in the second case, which I have read to you, I am under no apprehension that the patient's constitution is affected. I am satisfied, that as soon as her present local affections are well, that she will entirely have recovered from the effects of this disease. It is superfluous, there-

fore, to say that any specific treatment is unnecessary in such a case.

In taking an inflamed or suppurating bubo as a test of the action going on at the primary seat of disease, some little care may be requisite to distinguish the effects of the specific disease from any other accidental causes of irritation. In strumous subjects, a very slight increased action may, as I have before intimated, be the means of producing an enlargement of the inguinal glands, which may readily terminate in suppuration; and in these patients, other venereal affections (besides that which I have just described, and which I may designate as "acute ulceration") may be followed by suppuration of the absorbed glands in the groin. The affection may be suspected to be scrofulous if several glands are enlarged, and especially if several are enlarged upon both sides; or if they attain a considerable size without producing much pain; or if a considerable time elapse before they break.

Again, the application of caustic will sometimes give rise to an irritation, which will produce suppuration of the inguinal glands. By this means, the character of the disease may apparently be entirely changed; a sore which in its origin was indurated, may subsequently present the characters of acute ulceration. Such an action, produced in the later stages of the affection, would not prevent the effects of the primary disease, which may have begun to develope themselves even before the caustic was applied.

Another source of error in the interpretation of symptoms in these cases, is the existence of previous disease. It will often happen that during the suppuration of a bubo, from whatever cause arising, the general health will become impaired; and, under these circumstances, it is very probable that any syphilitic symptoms which had previously existed will reappear. It has happened to me on many occasions formerly, to attribute the appearance of such symptoms to the primary disease which had immediately preceded them. A careful investigation of the history of the case will enable us to trace the occurrence of such symptoms to their real source. To these, and to similar causes, may, I believe, be traced all the apparent exceptions which present themselves in practice to the law which I have mentioned; namely, that secondary symptoms do not occur as a consequence of acute syphilitic ulceration. The truth of this fact I would insist upon, quite independent

of any theoretical explanatious of the reasons why it should so be. The doctrine, as it is new, will doubtless meet with many opponents; and I shall therefore collect such statistical facts as I have, and bring them to your notice upon a future occasion. In the meantime, however, I would wish you to test the truth of the doctrine by the observation of cases as they present themselves, here or at other hospitals.

The third case to which I will refer is that of a single woman, E. A., aged 18. A month ago, a small ulcer made its appearance on the inner side of the right labium. This became rapidly larger, and has been throughout very painful, but has not at any period been accompanied by inflammation of the inguinal glands.

At the time of her admission, the sore was as large as a two-shilling piece, extremely painful to the touch, and presented a sloughing surface, surrounded by considerable general thickening. This patient was ordered a grain of opium three times a day.

On the 1st of November, the surface of the ulcer had become quite clean, and she expressed herself much relieved, both with regard to her general health, and also in respect to the local pain from which she had suffered so much.

Some of the secretion from the surface of the sore was now inoculated on this patient's thigh, and the inoculation covered by a piece of plaister.

On the 3rd, the inoculation had produced no effect.

When this patient was first admitted, it appeared to me doubtful whether the sore with which she was affected had been a sloughing one from the beginning, or whether it had been an indurated chancre, which, from some accidental cause, had subsequently assumed a sloughing character. This I believe to be a very important distinction; for, if the disease was accompanied by an inflammation terminating in sloughing within the first four or five days after its communication, it is next to certain that no constitutional symptoms will follow. If, on the contrary, the disease was at first an ordinary chancre, which at the expiration of two, three, or four weeks, began to slough from some accidental circumstance, then the sloughing, which occurred as a secondary and accidental effect, will not of course prevent the system from having previously become contaminated in the usual manner. It was, then, in order to decide this point that I inoculated this patient. It appeared probable that, if the sore had been a sloughing one from the com-

mencement, as soon as it assumed a healthy red surface, it would no longer contain any inoculable matter. If, on the other hand, it was originally a chancre on which an accidental slough had been produced, then the specific action would still be continued in the sore, and we should have an inoculable secretion from it. The test which I have adopted in this case is not, however, free from objections. It is liable to be interfered with by disturbing causes, all of which it may be impossible to trace in any individual case, and it may therefore be used in confirmation of other means in forming our prognosis; but I should not like to trust exclusively to it. The condition of the inguinal glands in this case has afforded us very little information; what we learn from them is of a negative character. They do not present the rounded smooth feeling which is so often found in cases of indurated sores; nor have they presented any tendency to inflammation and suppuration, so very generally observed in cases of ulcerating sores. The evidence derivable from them, then, as far as it goes, is in favour of this patient having been from the first affected with a sloughing sore. In that case, there will be no necessity for any specific treatment.

The syphilitic virus is very peculiar in requiring a definite time for its development in a part; and if, after it has been inoculated, the infected part slough, the existence of the virus will cease with that of the tissues in which it was contained. This is an observation which we have constantly the opportunity of verifying. When a part upon which an artificial inoculation has been made, is made to slough, by the application of caustic, within four or five days of the infection, a simple sore alone will ordinarily result. After the separation of the slough, the surface of the wound will not furnish an inoculable matter. In like manner, after natural inoculation, if the part inoculated sloughs within the first few days, a simple ulcer alone will be left. We find in such cases that there is no suppuration of the inguinal glands, because there is no ulceration of any infected part. There is no contamination of the system, because the virus, by means of which constitutional infection takes place, has been destroyed before the process has been gone through.

The three cases which we have now considered, may be regarded, as I have stated, as types of three very common classes of affections, differing in their mode of origin, in their

effects upon the constitution, and in the treatment which they require.

The first presented in its origin a sore surrounded by specific adhesive inflammation. The glands of the groin were in a state of slight chronic enlargement, and the constitution was affected with syphilis.

The second originated in a sore presenting the characters of acute ulceration. The glands in the groin became inflamed and suppurated. But I venture to say there will be here no constitutional affection.

The third, as far as we have been able to learn, commences as a sloughing sore, and has been accompanied by neither inflammation of the inguinal glands nor syphilitic affection of the system. At our next meeting, I purpose to make some further remarks on the second of these three forms of disease.

LECTURE II.

GENTLEMEN:—In my last lecture, I brought under your notice three forms of inflammation produced by the direct contact of syphilitic matter. In one of these, I mentioned that the action terminates directly in the death of the infected part; and I pointed out that, inasmuch as the syphilitic virus requires a living nidus for its development, the death of the part in which it is placed involves the destruction of the virus itself. The time during which the virus may remain in a part without producing any but a local action is at least four or five days. If within this time the part be destroyed by caustic, or if it slough spontaneously, a simple ulcer only will remain. There will then be no longer any local specific action; the inguinal glands will not participate in the disease; and the constitution will not become affected. If, however, the sloughing is produced after either of the other forms of inflammation have existed, then it will not interfere with the usual course of the disease, but may be regarded as an accidental complication.

Of this first effect of inflammation, we have examples in cases in which parts have been purposely inoculated, and the inoculation has been destroyed by the application of some caustic. I may mention here, that, in performing this operation, it is well to use the nitric acid or the potassa cum calce, in order to destroy the inoculated part. The action of the nitrate of silver is superficial, and there is reason to believe that it sometimes removes a superficial layer of the skin, without penetrating to the same depth as the point of the lancet.

The second form of inflammation produced by the direct contact of syphilitic matter, which I mentioned, was that in which the action terminated in acute ulceration. In this affection, the disease is not confined to the part to which the poison is applied; it may be traced in the clearest way along the absorbent vessels, generally on one side only. In any part of its course, the poison may inoculate the vessel in which it is contained, and may produce a fresh syphilitic sore, the secretion of which may again be inoculated. It usually happens, however, that the inguinal

gland in which the absorbent vessels terminate is the part affected. Here alone, in the great majority of cases, does the poison exercise its influence upon the absorbent system; but that the poison actually passes, as such, through the absorbent vessels, we have abundant proof in the occasional formation of specific abscesses in the course of those vessels. This circumstance has actually occurred in the case of the patient to which I have directed your attention, as presenting a well marked instance of this disease. Between the open bubo in the groin, and the inflamed and irregularly ulcerated surface at the seat of the primary disease, a small abscess has formed. This presents tumid and irritable edges; and I cannot doubt that an inoculable pus might have been derived from it. We can then distinctly trace the entrance of the syphilitic poison into the lymphatic vessels, and from them into the absorbent glands in which these vessels terminate. The actual existence of the virus in any part of this course may be demonstrated by experiments, which have been far too often repeated to require any additional confirmation. Arrived at this point in its course, on its way apparently towards the thoracic duct, and from there to the general circulation, what becomes of it? A very wonderful change is here brought about. The specific virulent poison, which before was liable to contaminate every living part that it came in contact with, cannot now be traced beyond this point. The absorbent vessels between the inflamed gland and the thoracic duct do not ulcerate or suppurate; the glands into which they empty themselves do not become enlarged or inflamed. The influence of the poison is here then gone. Beyond the glands first in order, the fluids which the absorbent vessels contain are bland and harmless, incapable of being inoculated, or of infecting any part with which they come in contact. What then has become of the poison? We find it in the vessels going into the inflamed absorbent glands, but we do not find it in the vessels which proceed from those glands. In a certain number of cases, no doubt, the poison is in great measure discharged in the suppuration to which its presence gives rise. But, when we consider the exceedingly minute quantity of an animal poison that is capable of producing its specific action on a part, this explanation is not sufficient. Some of the fluid or particles which enter the gland must, in some form or other, we should think, pass through it, whether it suppurate or not. Even although we should

suppose that the inflammation produced in the gland entirely obstructed its channels, still, before such obstruction could take place, some fluid would surely have time to pass; and this, if its quality remained unchanged, would be abundantly sufficient to inoculate any part with which it came in contact, or to infect the general system.

A somewhat analogous circumstance is observed in cases of cancer. The first set of glands which the absorbent vessels, coming from the seat of the disease, reach, are alone inoculated. The glands second in order, nearer the centre of the circulation, may be enlarged, but they seldom are the seat of malignant disease. Four weeks ago, a patient died in this hospital with obstinate chronic enlargement of the skin on the right labium. My friend Dr. Druitt, who carefully examined the tumour, assures me that the substance of the skin and of the subcutaneous areolar tissue was infiltrated with cells which he could in no way distinguish from epithelial cells. Shortly before her death, the inguinal glands upon both sides suppurated; but, upon examining the body afterwards, we could find no affection at all of the glands within the abdomen. The facts presented by such cases I wish to distinguish from any theoretical explanation of them; yet, must we attempt to give a rational explanation of the cause or connexion of the circumstances which we observe. Such an explanation will lead us to further inquiries into similar actions elsewhere, which may throw some light upon our inquiries, and perhaps, in their turn, be illustrated by them.

Independently of the essential nature of the affection, more glands will be found to be affected in malignant disease than in syphilis. This may probably be accounted for by the relative extent of parts affected in the two cases. In the first, the absorbent vessels derived from different parts of the disease may communicate the affection to several absorbent glands; in the second, the extent of surface involved is usually very limited, and the absorbent vessels leading from it are therefore also limited in number.

If we reflect upon the different ways in which foreign substances can be taken into the living body, we shall find that every such way is furnished with certain sentinels or guards which oppose the entrance of materials which, if admitted, would prove injurious. Whenever any irritating matters are applied to the skin, which might, by being absorbed, become injurious to the system, I need scarcely re-

mind you how the delicate sense of touch reminds us of what is going on, and urges us to get rid of the offending material. This is a sense common to the whole body. But the parts through which foreign matters are usually taken into the system are guarded in an especial manner. Thus, in addition to the sense of touch, we see the mouth guarded by the sense of smell and that of taste: three out of five senses concentrated around the opening by which the food enters into the system; and one at least of the other two always ready to assist in affording information of its nature. If we trace the food onward, we find that it has to pass the double row of teeth, which are acutely sensible to the presence of any hard particles which may have become accidentally mixed with the food. Should any fresh flavour be produced in the process of mastication, there are the means provided for appreciating it as the food passes through the posterior fauces. The stomach we find ready, in its turn, to reject that which is injurious; and, throughout the alimentary canal, there is an apparatus composed of a multitude of different parts, all combining to hurry on and eliminate from the system any materials which, if left, would be detrimental to it.

Finally—and this brings me back again to my subject—we have a wonderful system of minute capillary tubes (endowed with the faculty of distinguishing, so to speak, the chyle from other matters), taking up, pouring freely into the blood, that which is required for the nourishment of the system, but refusing to admit anything else. These lacteals, I need not remind you, are very similar indeed in structure, in disposition, and in function, to the absorbent vessels elsewhere. It is true that we cannot trace equally well the processes involved in assimilation and absorption, in the different individual organs of the body; but, even from what we do know, we have abundant evidence that the same care is taken with regard to each part as with respect to the whole; and that other channels, through which foreign matters may enter the system, are guarded with the same care as that by which the common food is received.

Such facts would lead us to the *à priori* conclusion, that some means must exist to prevent the indiscriminate introduction into the circulation of any materials which might find their way into the absorbents during the active ulceration of a part; and observation demonstrates to us that such a provision really exists. The particles taken up

by absorption ultimately again form part of the general circulating fluid from which they were at first derived. They have as much to be assimilated as animal matter taken fresh into the stomach. The bone, the tendon, the muscle, the nerve, which are thus removed, can no longer be recognised as such after they have been acted upon by the absorbents. All the different tissues that undergo this process form a single fluid, which ultimately becomes a part of the general circulating mass, and can then in no way be distinguished from similar products derived from the process of ordinary digestion. The action which converts foreign animal matter into blood, and that which converts parts of the living body into blood by the agency of the absorbents, are then analogous; and they agree in having the very remarkable property of converting some substances which, when introduced in any other way, act as poisons upon the system, into harmless agents. It has been shown by the Abbé Fontana, that the poison of the viper, when introduced into the stomach, undergoes some change which prevents its poisonous effects upon the system. It has also been shown by two French physiologists, that the same thing happens with regard to the Woorara poison; and we have it upon no less authority than that of Sir B. Brodie, that opium may be digested in the stomachs of some animals, and that in that process its poisonous qualities are destroyed. "I have injected", says Sir B. Brodie, "a strong watery solution of opium into the stomach of a rabbit, but no poisonous effect was produced, although a similar solution, injected into the cellular membrane, occasions stupefaction and death." In like manner, as I have before intimated, we find that cancerous matter cannot be propagated from a part to the general system through the lymphatic glands; but we have evidence to prove that it may, under certain circumstances, be so propagated through the blood-vessels. It is true that the veins in the immediate neighbourhood of a cancer are very frequently blocked up with coagula, affording another instance of the preservative power above mentioned; but, when this is not the case, the cancer cells may apparently be conveyed in the course of the circulation, and infect distant parts. We have an experiment on the authority of Langenbeck, related in the *Encyclopédie Anatomique*, in which some fresh cancerous matter was injected into the veins of a dog, and

cancerous tubercles were consequently developed in the animal's lungs.

In like manner, I suppose, it might be possible under certain peculiar circumstances to infect the general system with cancer through the absorbent vessels, but the fact already mentioned that the glands first in order, only are affected in consequence of local cancerous diseases forbids the idea that this is the way in which the disease is usually conveyed to other parts.

These observations will, I hope, prepare us to consider on sound physiological principles the change that is produced in the syphilitic poison during the passage of the matters in which it is contained through the lymphatic glands. These materials are themselves undergoing a change which will fit them for becoming part of the circulating fluid, and it would seem that the poison itself undergoes a change similar to that produced in the poison of the viper or in the Woorara poison in the stomach. It is well known that this power of digesting or resisting the effects of certain poisons may be acquired, and the experiments on syphilisation lately performed on the continent appear to give some countenance to the idea that a similar power may be acquired of resisting the effects of the syphilitic poison upon the system. It is well known that the human stomach may acquire the power of digesting opium, and that it may be taken in such quantities as to serve almost as an article of diet.

The action of the syphilitic poison must not, however, be confounded with that of other poisons which produce their effects immediately upon their application. A certain definite and peculiar action has to be gone through before the syphilitic virus can, under ordinary circumstances, enter the system. This action may vary according to the kind of inflammation to which its immediate application gives rise, but in all a certain interval must elapse before the poison can be absorbed so as to produce its specific effects upon the constitution. During this period it is that the ulcerative inflammation takes place in the class of cases which we are now considering.

In this process of ulceration, the freshly contaminated parts are constantly being removed. The tissues infected one day are removed the next. Now all experiments on inoculation have tended to prove that the syphilitic poison when removed to a fresh part, has to begin afresh the morbid

action peculiar to it, before it can infect that part and through it the constitution. But in the case we are considering, the infected parts are removed as they become impregnated with the poison. The poison, before its removal, may affect other parts, but it is removed, and apparently carried along the absorbents before the process can be gone through which in other cases issues in syphilitic disease of the system. Thus, a sore affected with acute syphilitic ulceration presents the phenomenon of a series of abortive inoculations, each part in its turn being infected and destroyed by ulceration before the process, which is essential to the action of the poison upon the system at large, can be accomplished. Ulceration, like mortification, destroys the vitality of the parts which it attacks, although in a more gradual manner; and as we have before seen that the syphilitic poison requires a living nidus and a certain interval of time for its development into a constitutional disease, the process of ulceration as effectually destroys that process as that of mortification does. There is, however, this difference, that in the latter the poison is expelled altogether from the system; in the former it is, in part at least, carried along the absorbent vessels. In these vessels we find it retaining its poisonous qualities until it enters a lymphatic gland. Here a power is manifested which prevents its introduction into the system—a power which, as I have conceived, bears some analogy to that which is evinced by the stomach in the conversion or rejection of poisonous substances. The difference in the nature of the fluid in the lymphatic vessels before and after it has passed the inguinal glands is analogous to the difference in the qualities of the Woorara poison before and after it has undergone digestion in the stomach and the lacteals. In both cases do the fluid contents of the lymphatic vessels undergo a change in the glands fitting them to become a part of the circulating fluid; in both cases are poisonous matters sometimes converted or assimilated, and sometimes rejected; by vomiting in the case of the stomach, by suppuration in the case of the lymphatics.

In looking over my notes of cases which have presented themselves at this hospital within the last year or two, I have collected together and arranged in a tabular form forty-nine consecutive cases of suppurating bubo. Of these, five only are recorded as having been accompanied by any secondary affection during the period that they remained

under observation. In one of these five, there was a distinct history of previous disease, both primary and secondary. In another, the cervical glands were enlarged, and the suppuration in the groin may, therefore, probably have been of a strumous character. In two cases, the secondary eruption was tubercular; an affection most obstinate in the nature, and most liable to recur after having once disappeared, and comparatively seldom occurring as the first symptom of cutaneous disease. These, then, I regard in all probability like the first of the five cases, as the result of some previous syphilitic infection. This analysis would thus leave only one case out of forty-nine in which a suppurating bubo was apparently even followed by secondary symptoms. In this exceptional case, the secondary eruption appeared a month after the occurrence of the bubo, and may, like the others, have depended upon previous disease.

On the other hand, I have collected and tabulated in the same way thirty-one consecutive cases of secondary syphilitic eruption. In one only of these cases does the history afford any mention of a suppurating bubo, and in that one case the history is not satisfactory upon the point. Had the notes of cases of other years been collected and tabulated in the same way I do not doubt that they would have afforded similar results. Such facts appear to establish indisputably the proposition that the chances of the infection of the system in cases of syphilis are inversely in proportion to the degree of irritation and inflammation of the absorbent vessels leading from the primary seat of disease. As this doctrine may probably appear to many to be contrary to the opinions usually entertained, I have though it well for the satisfaction of others to collect some independent evidence on the point; and for this purpose I have used the register of the Lock Hospital, which is kept by the house surgeons as they successively come into office. I find here recorded eighty consecutive cases of suppurating bubo. Of these, eleven are recorded as having had some other syphilitic affection besides the strictly primary disease during the time that they remained under observation. In four of these cases, this affection consisted in condylomata alone. In four of a tubercular eruption, and in three of psoriasis. It is to be remarked that here there is an entire absence of any mention of the presence of lichen, or lepra, affections of the most common occurrence as first presenting themselves after infecting syphilitic sores. The condylomata, especially

when they occur in female patients, are of such doubtful origin that they cannot be received as affording any evidence of the affection of the general system, at least as a consequence of the primary affections with which they are associated. Omitting, therefore, the cases in which they have been mentioned as occurring without any other symptom of constitutional disease, we have seventy-six consecutive cases of suppurating bubo from all causes, and in these mention is made of secondary affections in seven only.

The presence of secondary symptoms in this small proportion of cases may with justice be attributed to the recurrence of previous disease, and not to the primary affection which caused the suppurating bubo. This view is materially supported by the kind of eruption observed. In four out of the seven instances the eruption was tubercular, agreeing in this respect with the results obtained from my own case books. The facts presented in both collections of cases, therefore, point to the conclusion that in the comparatively rare instances in which secondary syphilis is found in conjunction with a suppurating bubo, that it depends upon the system having been infected previous to the disease which has given rise to that suppuration. The strongest proof, however, to my own mind of the truth of this doctrine, so full of practical value, is, that having directed my attention to the subject for a considerable time and having called the attention of the pupils to it both here and at King's College Hospital, I have not been able hitherto to find a single case in which a primary sore had clearly given rise to a suppurating bubo, and, at the same time, to constitutional syphilis. From observing, therefore, that where the absorbent vessels are most affected there is the least chance of any constitutional disease, I cannot avoid the conclusion that the absorbent vessels are not the means by which the syphilitic virus usually enters the system.

LECTURE III.

ON THE MEANS BY WHICH THE SYPHILITIC POISON ENTERS THE CONSTITUTION.

Physiologists have usually recognised three modes by which absorption may take place :—

I. That by which foreign substances find their way directly into the blood through the coats of the blood vessels. This mode of absorption occurs when poisonous substances are applied to an internal vascular and membranous surface, or when they are introduced into a wound, or when they are forced through the epidermis by friction on the surface of the body.

II. The absorption of the chyle from the mucous surface of the intestines by the lacteals. When the chyle is thus absorbed, it has been supposed by many physiologists that various other substances may be taken with it into the system.

III. Absorption by the lymphatics. This is supposed to occur either in the ordinary growth and renovation of the frame, or when parts are removed and not at the same time replaced, as in ulceration.

To these three modes of absorption, by all of which extraneous substances have been supposed to enter the circulation, we may add a fourth means by which the system may be influenced by the action of some kinds of poison : —namely, that in which a direct local effect is produced upon the nerves of a part, and through them upon the brain, (and consequently upon other organs), without the poisonous material being taken into the blood.

Examples of this mode of the action of poisons are afforded by the effects of the juice of the leaves of the aconite, and of the infusion of tobacco, as illustrated in some of Sir B. Brodie's physiological experiments.

In all those instances the action of the poison commences immediately upon its application.

But there are a very remarkable, and, to us, most interesting class of cases in which this does not happen. In these a certain interval must elapse, and a certain morbid process must be gone through before the poisons can pro-

duee their specific actions upou the general system. They are, therefore, with peculiar propriety rauked among the morbid poisons.

The deleterious materials of which these essentially consist, or the secretions in which they are contained, may be applied to the living body in any quantity, and for any length of time ; and unless the proccss, which is peculiar to each of them respectively, be gone through, their characteristic effects will not be produced upon the constitution.

If the particular action by which they individually enter the system be disturbed or interfered with—so as not to be carried out—other rcsults may follow, but their general influence will uot be experienced. If the first step in the process be defective, so will be its natural consequences.

The knowledge which we thus obtain furnishes us with a most important power ; for by modifying or alteriug the morbid process by which a poison enters the system, we may, under certain circumstances, modify or control its effects.

I purpose now to cousider how far the action of the syphilitic poison upon the constitution may be thus modified or controlled, by the kind of action which is produced when it is first applied to the living tissues of the body. For this purpose it is rcquisite to consider what the morbid actions really are by which the syphilitic poison gains an entrance ; and what the natural processes are by which it joius itself to, and becomes as it were incorporated with, the living being.

The opinions of Hunter on the absorption of the syphilitic poison have given a bias to all subsequent rcasonings upon the subject ; and the theories based upon his experiments are very generally received even up to the present time. He demonstrated, as he believed, that the lymphatic vessels were the true absorbents ; and he concluded from his discovery that they were the *only* absorbents in the system.

The experiments upon which his idea was founded deserve attention. Assisted by his brother and several other eminent medical men, he confined some warm milk in a portion of small intestine ; and having tied the artery and vein which supplied the intestine, he saw, as he believed, the lacteals of the part presently become filled with the white milk. Upon puncturing the vein upon the

distal side of the ligature, it was soon (by pressure of the finger), emptied of its blood. No white fluid could, during the continuance of the operation, be found in the vein. Upon a repetition of the experiment, in which the circulation through the mesenteric vessels was left free, the blood in the vein was carefully examined and compared with that in the neighbouring veins, but it was found not to be light coloured, nor milky, nor could any difference whatever be detected in it. It was found that even by firm pressure, which was continued until the intestine burst, the milky fluid could not be made to pass into the veins.

In another animal some thin starch, coloured with indigo, was introduced into the small intestine, and the lacteals were soon afterwards seen of a fine blue colour. A vein in this part of the mesentery was opened, and the blood which flowed was allowed to separate into coagulum and serum. The next day the serum had not the least blueish cast.

An injecting pipe was then fixed in an artery of the mesentery, where the intestine was filled with blue starch, and all communications both in the mesentery and intestine were closed, with the exception of the vein corresponding with the artery. Warm milk was now injected until it returned by the vein. This was continued until all the blood was washed away, and the vein returned a bright white milk. The milk thus circulating through the intestine containing the blue starch, was not in any degree changed in colour.

In a third animal, some musk in warm water was confined in a portion of the intestine ; after waiting a little time, some of the lacteals of the part were opened with a lancet, and some of the watery fluid which they contained was received into a small spoon. This was found to smell strongly of musk. Some blood received into a clean spoon from one of the veins of the same part, had not the least smell of musk.

From these and similar experiments, Hunter arrived at the inference, which must have appeared one of the greatest discoveries of his age, *that the veins do not absorb in the human body*. It necessarily followed from this that the lymphaties were to be considered as the only absorbents ; and this is stated by Hunter to be the fact, in his work on the venereal disease.

If the lymphatics were the only absorbents, they must of necessity have been looked upon as the only channels

through which poisons could, under ordinary circumstances, enter the system ; and accordingly we find Hunter asserting that the venereal matter is taken up by the absorbents of the part in which it is placed, and carried along the absorbent vessels to the common circulation. (pp. 256-257).

This view, deriving as it does such an apparent confirmation, with regard to the venereal disease, from the frequent occurrence in it of inflamed lymphatic glands, has been adopted, with more or less modification, by almost all subsequent writers.

The accuracy of the experiments upon which Hunter based his theory have, however, justly been doubted by other physiologists ; but the theory itself has hitherto, strange to say, scarcely been questioned.

MM. Tiedemann and Gmelin, after mixing various substances, which might easily be detected, with the food of animals, not unfrequently found unequivocal traces of these substances in the venous blood and urine, whilst it was only in a very few instances that traces of them could be discovered in the chyle.

In repeating Hunter's experiments, Mayo found that half an hour after a solution of starch and indigo had been placed in the cavity of the intestine, the lacteals appeared of a clear blue colour, and those present were for a time satisfied that the indigo had been absorbed. But upon placing a sheet of white paper behind the mesentery, it was found that the blue tinge disappeared. On removing the white paper the vessels reassumed their blue colour. It became, therefore, evident that the blue tinge was the natural colour of the empty lacteals ;—that while they continued to absorb the chyle they were white, but that as soon as they were simply empty, they appeared blue.

Thus a repetition of the Hunterian experiments rather tends to prove that the function of the lacteals is limited to the absorption of chyle : and that the lymphatics are not the only absorbents, appears most conclusively demonstrated by the experiments of MM. Magendie and Ségalas. M. Ségalas varied Hunter's experiment in the following manner :—a fold of small intestine was drawn out of a wound in the belly of a dog ; all the blood-vessels passing to and from it were tied, with the exception of one artery ; a vein punctured upon the mesentery allowed the blood to escape, which would otherwise have stagnated

in the part. The lacteal vessels and nerves were left entire. The fold of intestine was then tied at both extremities, and an aqueous solution of the alcoholic extract of nux vomica was poured into it. During the hour which followed, the poison produced no symptoms. The ligatures being then removed from one of the veins, the blood was allowed to return in the natural course of its circulation. In six minutes from this time, the poison took effect. The experiments of M. Magendie illustrating the same point are well known.

The thigh of a dog was separated by M. Magendie from the body, by a division of every part, with the exception of the artery and vein ; into each of these vessels a quill was introduced, and tied by two ligatures; between these ligatures the vessels were divided, and thus all communication was cut off between the body and the limb, except that which was maintained by the circulation of the blood. Two grains of the upas tieuté were then inserted into a wound in the foot of the separated limb. In about four minutes the poison manifested its effects upon the system.

From these and other facts, it appears certain that Hunter's idea of the lymphatics being the only absorbents is incorrect ; and we are thence naturally led to the consideration of the value of the theory which was based upon that notion.

A careful observation of the origin of syphilitic affections will show that the diseased action to which the poison gives rise on its primary application, is not always the same. The differences observable may be traced either in the natural course of the disease, or by means of artificial inoculation.

In one class of cases as observed in practice, the secretion from the infected part will, in the early stage of the disease, consist of a thin serous fluid more or less turbid, and the parts immediately involved will become indurated in a very peculiar and characteristic manner.

In a second class, the discharge will at the same period be more discoloured, and the parts affected will present a ragged and uneven surface. There will here be none of the peculiar and characteristic induration above mentioned.

In a third class, the secretion will from the first consist of well formed pus. The surface from which it proceeds may be even and regular, and there will be no peculiar

induration, except that which may result from the granulations of the exposed surface.

In a fourth class, the part infected passes at once into mortification, or into that modification of it which has been called phagedæna.

After artificial inoculation these four kinds of affection may likewise be distinguished; but, as will hereafter be more fully explained, (from the fact of inoculation having been almost exclusively practised on those whose systems were already under the influence of the syphilitic poison), one or two of these forms of disease have been much more commonly observed than the others.

We may, however, distinctly observe that in some cases after inoculation, no pus is secreted before the fourth or fifth day. Up to this time the secretion is a fluid, transparent at first, but becoming gradually more turbid. As it becomes purulent, the subjacent tissues become infiltrated with plastic lymph, which gives to the touch the sensation of certain forms of cartilage.

At other times after inoculation, we find that the surface of the part will be covered by a crust of different shades of brown or yellow; and when this is removed, that a ragged irregular surface will present itself.

Again, in another class of cases the inoculation will present, as early as the following day, a well formed pustule. The secretion will be quite white, and entirely different in character from that observed at the same period in the first above-mentioned class of cases.

Finally, we may have a phagedenic or sloughing sore as the result of inoculation, an effect often purposely produced by the application of caustic. In none of the three last descriptions of cases have we the characteristic induration observed in the first.

In immediate connexion with these different kinds of primary affection, I have to observe—

1. That in practice a sore which presents from the first a ragged and uneven surface will, with tolerable certainty, be accompanied by an inflammatory bubo; and that this bubo will very generally suppurate be the treatment what it may.

11. That in the experiments which have been so lavishly performed by means of inoculation (in attempting to induce that condition of the system known or imagined as a state of syphilisation and for other purposes), the occurrence of

any seeondary results from those inoculations has been almost unknown.

III. As bearing direetly and practically upon the theory of the absorption of the syphilitie poison, an extensive observation of eases will be found to establish the two following very important points, viz.: that in those eases where the irritation of the lymphatie glands is the greatest, we have very seldom indeed any seeondary syphilitie affection; and that in the best marked eases of general infeetion we as rarely find that the eonstitutional disease has been preeeded by inflammation of the lymphaties. These latter eireumstanees are direetly opposed to the idea of the system being eontaminated throngh the absorbent vessels: where these are most affected, the system generally esoapes; where these are not inflamed, the system is often infeeted.

This snbject has been very imperfectly illustrated by the physiologists of the present day, and even those who have written expressly upon syphilitic affeetions have generally been satisfied with reeording the faets whieh they have observed relating to it, without attempting to explain them.

Something more satisfaetory, I am inelined to believe, may be arrived at, by an attentive eonsideration of the earliest stages of the morbid proeesses whieh are involved in the absorption of the syphilitie poison.

The great author of this mode of investigating disease has prefaeed his treatise on venereal affeetions with the following remarks whieh here find their appropriate plaee, and which, as I believe, have not reeeived the amount of attention whieh they deserve, and have not been applied as they might have been to the illustration of our present snbjeet. "No two actions", says Hunter, "can take place in the same constitntion, nor in the same part, at one and the same time. No two different fevers ean exist in the same eonstitntion, nor two loeal diseases in the same part at the same time." It might appear strange to any one who had not considered the snbjeet in its physiologieal relations, that sueh ideas shonld oecupy so prominent a position in Hunter's work on the venereal disease, and that they shonld be dwelt upon in this rather than in any other of his writings. They are, nevertheless, I believe, the principles upon which mueh that is apparently obseure in relation to this disease may be explained. They afford a remarkable instanee of that in-

tuitive insight so peculiar to our great physiologist, by which comprehensive general ideas are appreciated in their extent and simplicity, even where their application to particular details may not have been traced.

For truth and clearness, the description of a primary syphilitic ulcer has not been excelled since Hunter's time; "a chancre", he says, "has commonly a thickened base, and although in some sores the inflammation spreads much farther, yet the specific inflammation is confined to this base." This specific action in which the arteries throw out coagulable lymph, depends, according to the Hunterian nomenclature, upon *adhesive inflammation*. The action by which parts are removed is called the *ulcerative inflammation;* that by which pus is formed, the *suppurative inflammation*.

These three effects of inflammation Hunter regards as distinct actions, and therefore incapable of being produced in the same part at the same time. Now that which is peculiarly characteristic of the syphilitic infection of a part is a specific adhesive inflammation. This has no necessary connexion at all with either ulceration or suppuration, and indeed, according to the Hunterian doctrine, it is incompatible with either of them. Of all the kinds of inflammation to which the contact of syphilitic matter gives rise, this alone can be distinctly and certainly associated with the occurrence of secondary symptoms.

It is true that we almost always find that a part affected with syphilitic induration also suppurates, or ulcerates upon its surface; and in the more advanced stages of the disease we often see that all the parts which have been indurated pass into suppuration or ulceration. In the former case, the adhesive and suppurative inflammations affect different parts (although in close proximity to each other); in the latter, these distinct actions affect the same parts but at different times.

An action commenced in a part will continue until the cause determining it ceases; or until it is superseded by some more powerful action. If, therefore, the ulcerative or suppurative inflammation be set up by venereal infection, it will continue until the poison has expended its influence, or until the part is attacked by mortification, or influenced by some other cause sufficiently powerful to supersede the original action. Hence it follows that if a venereal sore in its origin is affected with either the suppurative or the

ulcerative inflammation, it is most unlikely subsequently to become indurated.

A most important distinction here arises between those cases which in their origin are accompanied by specific adhesive inflammation, however limited in extent, and those which from the first suppurate, ulcerate, or slough. In the first class the poison will, with tolerable certainty, affect the system, unless prevented by medical treatment or the influence of some peculiarity, or some other disease. In the latter, the local affection will never, I believe, be followed by constitutional syphilis. Ulceration and suppuration, like mortification, destroy the vitality of the parts which they attack, although in a more gradual manner, and as the syphilitic virus requires a living nidus and a certain given space of time for its development, it is destroyed in these actions before it becomes, in the process of growth, taken into the system.

Thus practically we may say, that if a suspicious sore is from the first affected with ulcerative inflammation, or if from the first there be a free secretion of well formed pus, or if at the same period it should slough either naturally or from medical applications, the existence of the syphilitic virus will cease with that of the parts which it has infected. The disease, as far as its specific characters are concerned, will be a local one.

From what has already been said, it may be inferred that ulcerative inflammation is as incompatible in the same part at the same time with suppurative inflammation as it is with adhesive inflammation; and, in perfect accordance with this, we find practically that when an infected sore suppurates very freely from the first, or sloughs, that there is seldom any affection of the lymphatic system. But that, on the other hand, when ulcerative inflammation is early established, characterised by the ragged and uneven surface of the sore, the absorbent glands become suddenly and violently inflamed.

In these cases, we may trace in the most satisfactory manner the progress of the syphilitic poison along the absorbent vessels as far as the first lymphatic gland with which it comes in contact. In any part of this course the poison may be arrested, and may there produce a fresh syphilitic ulcer; and that the absorbent glands into which these lymphatics empty themselves may become affected, we have daily proof from the secretions of these glands being themselves in-

oculable. Up to this point, then, we have unequivocal evidence of the presence of the syphilitic poison, and of its power of contaminating fresh parts. Beyond this, the poison can no longer be traced. The fluids in which it was before contained now neither possess the power of irritating the vessels through which they pass, nor, when extravasated from these vessels, of infecting other structures. Here, then, some wonderful change is produced. The specific characters of the poison can no longer be detected either by its morbid effects, or by inoculation. Even Hunter noticed this circumstance. He says, "we never find the lymphatic vessels or glands that are second in order, affected". And he remarks that when the disease has been contracted from a cut upon the finger, he has seen the bubo come on a little above the bend of the arm, upon the inside of the biceps muscle. In such instances no bubo has formed in the armpit, the most common place for glands to be affected by absorption.

Neither observation nor experiment, then, afford any proof that the syphilitic virus is conveyed, as such, through the absorbent glands; all the direct evidence which we have points to an opposite conclusion. The particles in which the poison resides here undergo some change, become perhaps disintegrated, and in that process the existence of the poison appears to cease.

The evidence upon which it has been assumed that the syphilitic poison enters the system through the absorbent vessels must, therefore, be regarded as most inconclusive. Arrived at the first lymphatic gland which it meets, and there undergoing some change, it becomes incapable any longer of producing, either locally or constitutionally, its specific effects; and we cannot therefore admit that this is the way in which the system becomes infected. It will doubtless be asked, if a primary syphilitic affection will give rise to a bubo which itself may be proved by inoculation to be syphilitic, how it is that this bubo does not become a fresh source of infection? How is it that the virus may not be absorbed from the parts thus affected, so as to produce a second bubo? and how is it that the poison from this source may not be received into the system by some other means? The answer to this question is twofold. Practically, neither of these circumstances occur; theoretically, the supposed difficulty is met by a consideration of the principles already laid down. During the time that

the fluids impregnated with the poison are contained in the absorbent vessels, the poison can of course exercise its influence only upon those vessels. Whenever it does so, it gives rise to inflammation, which, as it depends upon ulcerative inflammation in another part, will probably here be of the same character. As soon as an absorbent vessel or gland is thus attacked, the cellular tissue around it will become also inflamed, and will suppurate. All experiments have gone to prove that the pus formed on the outside of a lymphatic vessel is different in character to the fluid derived from the gland itself. The latter is inoculable; the former not. The action by which the parts around an affected lymphatic participate in the disease is, therefore, simple suppurative inflammation, which we have before considered as a process not capable of communicating the syphilitic disease to the general system. As, therefore, the contaminated fluid in a lymphatic vessel cannot pass unchanged through the absorbent glands, and can find its way to the surface only through tissues in a state of suppuration, in neither case are its poisonous effects communicated to other parts. In the action by which the poison contained in an absorbent gland is eliminated by suppuration, the whole surface involved may become inoculated by the syphilitic matter; but the inflammation being in its origin of the suppurative kind, the original action is not by this fresh inoculation altered in its character. The process, once commenced, is continued, and, during its continuance, is incompatible, as we have seen, with specific adhesive inflammation, which, according to the view now taken, is alone capable of all the kinds of inflammation, of communicating general syphilitic infection.

To these remarks I may add, that experiment and observation concur in proving that, every time that a fresh inoculation takes place in the same individual from the same original source, the effects of the poison will show themselves with less severity.

It is not intended by anything that is here stated to imply that vitiated fluids may not enter the circulation through the absorbent system, even when the morbid process which gives rise to their formation has had its origin in the venereal disease. Well marked cases from time to time present themselves, in which the lymphatic vessels. the absorbent glands, and even the thoracic duct, are found distended with puriform or sanguinolent fluid. Such dis-

eased products poured into the circulation must necessarily have a deleterious influence upon the constitution. They may give rise occasionally to eruptions upon the skin, which may more or less resemble true syphilitic affections. These eruptions usually appear before the primary affection to which they may be attributed subsides. They often disappear of their own accord, and do not generally recur. Many of the diseases which, from Abernethy's time to the present, have been described under the titles of "diseases resembling syphilis", "a mild form of secondary symptoms", etc., I have little doubt, may be included in this class. They may depend, as I have said, upon the absorption of inflammatory products resulting from local venereal infection, but I cannot regard them as arising from the presence of the syphilitic virus itself.

The poison of the viper, or the Woorara poison, or a solution of opium, may be introduced into the stomach of some animals without producing their poisonous effects; but it does not follow that the digestion of these substances would be followed by no disturbance in the system. In any of the cases mentioned, some disorder might arise, although not depending upon the specific effects of the poison. In any, a like action might be induced by substances in themselves possessing no specific or poisonous qualities.

From experiments which have been now varied in a thousand ways, and most unnecessarily repeated, it has been proved beyond a doubt that the syphilitic poison may remain in contact with an abraded surface, or may be inserted beneath the cuticle, and allowed to remain there for three, four, or even five days, and no absorption may occur. If, during this time, an inflammatory action is set up, which is incompatible with specific adhesive inflammation, no general infection will follow. If, for instance, the part is made to slough by the application of caustic, as soon as the slough separates, a simple sore alone will remain. From this, it is evident that a certain time must elapse after the application of the syphilitic poison before any absorption can take place. This requisite period of incubation it is that secures the system against infection in cases where, from the first, ulcerative or suppurative inflammation has taken place. A part, in the course of being contaminated, becomes by these processes dissolved or removed before the act of absorption can be completed. Fresh parts, which may continue to be attacked, are destroyed before they can act as the channels

of infection to the constitution. Hence occasionally arise those extensive local intractable ulcerations which have received the name of serpiginous or creeping sores. These, however formidable they may be as local diseases, do not give rise to secondary syphilitic symptoms.

We have here the secret of the absence of constitutional results after artificial inoculation in the numerous experiments that have been made on syphilisation. These experiments have been tried only on those whose systems were already under the influence of the poison; and it appears to be a very general law that, in such cases, any fresh inoculations pass rapidly into suppuration, or ulceration—processes, as I have said, incompatible with the specific and infecting kind of inflammation. Where several artificial inoculations have been performed, and these inoculations have at once suppurated, the circumstances are in many respects similar to those in which any patient would be placed if he had a suppurating bubo. Many small spots of suppuration, and one large spot, I conceive to be nearly equivalent to each other; in neither case is the poison absorbed from these secondary inoculations. This circumstance it doubtless is that has given some of our continental brethren the idea that repeated inoculation may be a preventive against future syphilitic infection.

It is, I believe, undoubtedly true that, while a syphilitic sore is undergoing ulceration or suppuration, any similar affection arising from fresh inoculation will do the same; and it is quite possible that this tendency may be kept up by repeated inoculation for an indefinite time. During this period, no fresh absorption of syphilitic poison will take place. The same immunity is afforded by a suppurating bubo during its continuance, and perhaps for a considerable time after it has healed. But, in either case, allow an interval to elapse during which this tendency to ulceration or to suppuration shall have worn itself out, and the system will again become subject to genuine syphilitic infection, and be again liable to fresh forms of secondary disease.

From all the observations which have now been made, I conclude that the idea originated by Hunter, and received by his followers, that the syphilitic poison is taken into the system by the lymphatic vessels, is, to say the least, entirely devoid of proof. The real way in which the system does become infected may, I believe, be traced in another and much more satisfactory manner.

When syphilitic inoculation takes place in a healthy person, and the regular course of the disease is not interfered with, two distinct processes may be recognised; one, that by which the affected tissues become infiltrated with lymph; the other, by which this effused matter is removed. This latter result may be accomplished by sloughing, by ulceration, in the natural process of growth, or by different modifications of these. But, beyond the parts immediately involved in these processes, other actions are going on of a more subtle nature, and not so easily appreciated by our senses. In the absence of more positive knowledge, we may ascribe these to the molecular changes in the nutrition of the surrounding parts. That such actions are in active operation beyond the parts where any visible or sensible change has taken place, may be readily demonstrated, although we may be unable to define their exact nature. Were this not the case, we should have nothing to do in the case of a primary syphilitic sore but entirely to remove the ulcerated and indurated tissues, and the disease would, as far as the part is concerned, be at an end. Experience proves that such is very far from being the case. When a syphilitic sore is removed by excision, as may readily be done when it is situated on the extremity of the prepuce, the cut surface will in a few days take on the specific action. This I have verified even when the greatest care has been taken not to allow any other matter from the chancre to come into contact with the cut surface. Such an action taking place in a part apparently healthy, at some little distance from the original sore, presupposes some antecedent change in the tissues in which it originates—a change produced by the infecting poison, but not capable of being appreciated so long as the diseased action had its development in its original situation. As soon, however, as the first centre of the morbid action is removed, a similar disease is induced upon the neighbouring cut surface. The observation of such cases demonstrates the existence of a subtle morbid process beyond the parts at first sensibly affected, and necessarily producing some change in their nutrition.

It appears under these circumstances much more in accordance with that which is known to happen in the case of the absorption of other poisons, to suppose that the blood circulating through the tissues in which these morbid actions are going on is directly influenced, than to refer the symptoms to the passage of the poison primarily through

the absorbent system. When the constitution becomes affected in consequence of the inoculation of the vaccine or the variolous poisons, the lymphatic glands appear certainly to perform no essential part of the process. Few indeed have thought it necessary to invoke the aid of the absorbent system to account for the action of these poisons upon the animal economy; and I believe that it is equally unnecessary in the case of the poison of syphilis.

At present, I have only considered the different kinds of inflammatory affections produced by syphilitic contagion. The existence of similar non-inflammatory modes of infection (such as the absorption of the syphilitic virus without any change of structure in the parts to which it is applied, or the production by some means of tubercles or excrescences not having an inflammatory origin) form a subject for separate consideration.

LECTURE IV.

ON SYPHILISATION APPLIED TO MAN AND ANIMALS.

When syphilitic matter is artificially inoculated with the point of a lancet, the following appearances may be observed :—Within the first twenty-four hours, the inoculated point becomes red ; from the second to the third day, it swells slightly, and presents the appearance of a pimple surrounded by a red areola. Between the third and the fourth day the epidermis, raised by a liquid more or less turbid, often appears as a vesicle, which at its summit presents a black point, the result of the dried blood effused from the prick of the lancet at the time of inoculation. From the fourth to the fifth day, the morbid secretion increases, and becomes puriform. After the fifth day, the subjacent tissues become infiltrated and hardened by the effusion of plastic lymph. Finally, from the sixth day, the secretion becomes thicker, the pustule breaks, and a scab forms on the surface ; when this is removed, an ulcer is left, surrounded by a hardened base, which occupies the whole thickness of the skin. The thickening terminates abruptly, and does not gradually extend itself into the surrounding parts. The edges of the ulceration are clearly defined, and partaking of the induration often form a reddish brown rim, slightly elevated above the level of the skin.*

But in certain states of the system a similar inoculation of syphilitic matter will be followed by different local symptoms. The day following the inoculation, instead of a pimple, a pustule will be making its appearance. On the third day, and sometimes earlier, this will be fully formed, and the fluid which it contains will consist of well formed pus ; when this is removed, the surface below will soon granulate, and present in every way the same appearance as that which is left after a secondary pustular eruption. There is here no peculiar induration of the base, nor of the edges of the ulceration ; no appearance of a pimple upon the inoculated spot ; and no corresponding interval during

* Ricord, p. 80.

which the secretion consists only of turbid serum. In one case the appearances are, in their origin, those of adhesive inflammation, in the other of suppurative inflammation; and these constitute two very different classes of disease, both in respect to the local affections and their constitutional consequences.

In repeating these experiments upon inoculation on the same individual, it has been found that the first chancre produced lasts longer than the second; the second longer than the third, and so on. Hence arose the idea that, by a succession of inoculations, a point might be arrived at after which the system would not be suseeptible of any fresh syphilitic infection. To this subject I shall again return; but at present I wish to direct your attention to the fact, that out of a great number of experiments which have been tried on syphilisation, no secondary symptoms (at least from the published accounts) appear to have arisen. The plan of successive artificial inoculations has even been strenuously advocated for the cure of both primary and secondary syphilitic affections, with what success we shall hereafter see.* At the same time, the idea suggested itself of trying whether the syphilitic poison might not be made to pass through the system of some animals, so that its virulence might in that action be mitigated. It was thought that, after such a modification, it might possibly be again introduced into the human system in a milder form, and it was suggested that by being inoculated in that form, it might be the means of preventing the more serious evils which arise from syphilitic infection under ordinary circumstances. It was, in fact, hoped that a modified action might mitigate or prevent the consequences of syphilitic infection, as vaccination acts with regard to small-pox.

In investigating the results of these experiments, I am as far from thinking that there is any chance of finding the power that was looked for, as there was with the alchymists of old of finding the philosopher's stone. But it may nevertheless happen, as with them, that in looking for one thing, other things may (as it were accidentally) be discovered. Now, the series of experiments to which I refer afford excellent examples of the second class of cases

* Any one who may wish to follow the different plans which have been adopted with a view of producing syphilisation, will find an excellent account of them all, in a little work on the subject, by M. de Méric.

which I have now brought under your notice; namely, those in which the inoculated part suppurates at once, and in which there is, as far as has been observed, no subsequent constitutional affection. One of the causes which determine an inoculated part at once to pass into suppuration, appears to be the fact of the system being already under the influence of the syphilitic poison. I have noticed this particularly with regard to that state of system which precedes the development of secondary symptoms; and I believe that the remark is best illustrated when the inoculation is performed upon patients during the interval which elapses between the healing of a primary indurated sore, and the appearance of a secondary eruption.

A patient, a short time ago, presented himself at King's College Hospital, with a well defined indurated cicatrix on the prepuce. As the ulceration had healed, the patient seemed to make very light of the "little lump" that was left, and I clearly saw, from his manner, that it would be in vain to persuade him to continue a sufficiently long course of treatment; and without this I conceived he would with tolerable certainty have secondary symptoms. I therefore recommended him to have the indurated part removed, which was accordingly done by a clean cut with the knife, and the cut edges were brought together. As there was no sore in this case, there could be no inoculation of puriform matter; nevertheless, as I had observed to happen in similar instances, in two or three days the whole of the cut surface presented an irritable phagedenic appearance, and afforded a copious secretion of discoloured puriform fluid. Some pus, taken from this surface, and inoculated upon the patient's thigh, gave rise to a well formed pustule on the following day. There was no bubo in this case, and as far as I know, no subsequent syphilitic eruption.

From this and other cases it has appeared to me that syphilitic inoculations suppurate much more rapidly in those whose systems are already under the influence of the disease; and that when this is the case, the inoculations are not accompanied by inflammation of the absorbent glands, and are not followed by any additional constitutional infection.

It would further appear that, where under ordinary circumstances a constitutional affection might be expected, the occurrence of a phagedenic ulceration will prevent the

development of the constitutional symptoms. During the last spring, a patient was sent to me by Dr. Budd, from King's College Hospital, where he had been treated for ague. This man had a very long prepuce, with a well marked indurated chancre at the extremity. He had never, he said, had the disease before. His health was not such as admitted of the usual treatment, and I therefore determined to remove the diseased portion of the prepuce. This was done at a considerable distance from the induration, and care was taken that none of the matter from the sore should come in contact with the cut surface. The wound appeared to heal by the first intention; but, at the end of three days, it opened again. It now presented a phagedenic surface, situated upon a thickened base, and affording a free secretion of pus. This was proved by inoculation to be syphilitic. It was some time before this ulcer healed, but it did so without any specific treatment. There was no bubo in this case, and no constitutional symptoms up to the time of his leaving the hospital, nor have any, I have reason to believe, occurred, since that period. It is to be remarked that in both the last-mentioned cases, the syphilitic action commenced afresh in apparently sound parts. This shows that the local influence of the poison extends beyond the parts apparently affected. The fresh action is not precisely of the same kind as that which caused the original ulcer. That was characterised by a peculiar and specific induration; this by a phagedenic surface affording a free purulent secretion. The great point of interest in these cases is, that the parts not directly inoculated, and at some little distance from the apparent seat of disease, should under inflammation arising from an accidental cause, produce a secretion capable of being inoculated. This clearly shows that the syphilitic action had extended beyond the limits of the apparent local disease; and yet, after the occurrence of the subsequent suppurating phagedenic sore, no constitutional symptoms appeared. Some further explanation of these points, which have hitherto scarcely been investigated, will present themselves, if we review some of the cases and experiments which have been recorded in order to illustrate the subject of syphilisation.

Syphilitic infection of the system appears, as I have said, to modify the action produced by fresh syphilitic inoculation; and, therefore, as for very obvious reasons, few have

ventured to inoculate patients who were not previously infected, we have not perhaps had the opportunity of fully observing what the effects of syphilitic poison are when *first* artificially introduced into the human system. It has been attempted to supply this deficiency by inoculating animals; but they are found so little susceptible of the syphilitic poison in any form, that the information gained from such observations must be received with much caution as illustrative of any similar actions on human beings. Still there are some very interesting and instructive details furnished to us in this way.

Although many attempts had previously been made to inoculate animals with syphilitic matter, no satisfactory results were obtained until within the last few years. Hunter had made a variety of experiments upon the subject, and had concluded that man alone was susceptible of the influence of the syphilitic poison. Many other physiologists arrived at the same conclusion. Even Ricord, in his treatise on syphilis, says that he had tried to inoculate syphilitic matter, under every possible condition, on dogs, cats, rabbits, guinea pigs, etc., without ever being able to communicate the disease. Until very lately it was, in fact, universally received as an axiom, that human beings alone could be infected with the syphilitic poison. In the year 1844, M. Auzias Turenne commenced some fresh experiments upon this subject. Among his subjects was a monkey, paralytic in his upper extremities, and who consequently always remained sitting up; in this position it was impossible for him to lick some parts of his hinder extremities, and M. Auzias found that upon those parts he could inoculate him, but that it was impossible to do so upon parts that he could reach with his tongue. He, therefore, in subsequent experiments, selected the back of the ear, adjoining the mastoid process, as the most favourable situation. He performs the operation with a pair of curved pointed scissors, with which he cuts through the epidermis so as not at the same time to cause any effusion of blood. The matter to be inoculated is then placed upon the part, either diluted or not with a little saliva. If the puriform fluid is thick, there is danger that it will dry and congeal around the poison, and so prevent it from producing its action on the surrounding parts. Some amount of dilution is necessary occasionally to prevent this. The inoculated point is kept moist for about a minute, and the skin in the

immediate neighbourhood is rubbed gently with a soft instrument, so as to excite vascular action in the part.

The day after this operation, according to M. Auzias, a pimple shews itself on the inoculated spot. The third day a vesicle appears, and twenty-four hours later a pustule. These appearances, which are perfectly regular in their succession, may take a longer or a shorter time in developing themselves ; they issue in the formation of a chancre, covered by a crust. The chancre is round and becomes larger ; an abundant and deep-coloured suppuration raises the crust, and the epidermis for some distance around the neighbouring skin is warm, red, and swollen. The pus secreted escapes underneath the edges of the scab, which it raises and detaches. The escape of the pus is often assisted by the animal scratching himself, which he is very likely to do on account of the irritation produced.

After a certain quantity of pus has escaped, the parts become less tense. The edges of the scab again adhere to the subjacent parts, or if it has been removed it is formed again in small detached portions. There is some retraction of the epidermis, which becomes starved around the chancre, and is thrown off. The chancre follows its course for several days, and the last-mentioned actions (those which occur subsequently to the formation of the pustule) are repeated several times. At length the sore becomes smaller, and finally disappears without ever having lost its characteristic appearance of a chancre on the skin. "It is possible", says M. Auzias, "to propagate a chancre in this way from animal to animal, in successive descent, for an indefinite number of generations, without the virus losing its efficacy".

The fact having been proved that the syphilitic virus might thus be communicated to an animal, some intrepid experimenters undertook the farther task of ascertaining whether the poison, in being transmitted through an animal, had lost any of its virulence, or had become modified in its mode of action.

On the 5th of June, 1850, M. Auzias inoculated a healthy monkey on the anterior part of the right helix, in two places a little distance from each other.

M. Robert de Wetz, four days afterwards, inoculated himself with the pus derived from the ulceration on the monkey's ear. The operation was performed on the 9th

of June, at eleven o'clock in the morning. On that and the following day no results appeared.

On the 12th, in the afternoon, M. Wetz was surprised to find that the epidermis was raised over the inoculated spot by fluid, and that it was surrounded by a red halo.

On the morning of the 13th, the vesicle burst, and a drop of pus of a greenish yellow colour escaped. The red areola had at this time slightly increased.

On the 14th, the inoculation was covered with a light scar, beneath which was a grey lardaceous surface, surrounded by a well defined margin. The subjacent tissues were becoming inflamed, infiltrated, and indurated.

On the 15th, at noon, the secretion of pus had increased. The surrounding tissues were inflamed to some extent, and the motions of the arm had become painful.

On the 16th, the chancre had increased, with an increase of inflammation in the surrounding tissues. M. Wetz now experienced a slight shivering, followed by a sensation of heat, weakness in the limbs, and vague pains in the joints. His head then began to ache, his appetite left him, and the water became of a deep red colour. The next day, all these symptoms had disappeared; but there was a slight eruption of roseola on the skin. On the tenth day of the inoculation, it was destroyed with Vienna paste.

M. Wetz inoculated himself a second time with the pus taken from the monkey, with similar results, with the exception that the second inoculation on him attained at the same period of its development a much larger size; and the cellular tissue around was inflamed and indurated to a much greater extent. It was, however, impossible to determine whether this induration depended in any degree upon the specific action of the poison on account of the surrounding inflammation.

Not satisfied with these results, M. Wetz inoculated himself with the pus taken from the sore on the monkey's ear a third time. He took the precaution of using only instruments which were quite new and had never been used. The results this time were not so soon developed. On the first two days nothing appeared; but on the third day it was evident the inoculation had succeeded, and on the seventh day it presented the character of a well developed chancre. This inoculation, like the former, was followed by a violent inflammation in the surrounding cellular tissue. But in none of the instances was there any enlargement of the axillary

glauds. M. Wetz undertook to make known publicly if any subsequent symptoms showed themselves; and as there has been as yet no intimation to that effect, we must believe that none occurred.

With a courage worthy of a better cause, M. Robert also tried upon himself some similar experiments.

On the 16th of August he took from two simple chancres in full activity and on the tenth day of their existence some pus, and inoculated it on the middle of the inside of the ear of a cat three months old, and in perfect health. On the 18th, a hard point the size of a pin's head presented itself.

19th. The puncture was covered by a crust, beneath which was a superficial round ulceration, a line in diameter and exuding a milky puriform fluid. This sore was situated upon an induration which caused a prominence on the outside of the ear, and which could readily be detected by the touch. On the same day, some of the pus from this inoculation was transferred to the corresponding part of the left ear of the same animal.

20th. The first inoculation covered by a yellowish red crust presented a circular bluish wound, from which exuded a certain quantity of milky white pus. M. Robert took some of this secretion on a clean lancet, and inoculated himself on the lower and external part of the left arm.

21st. The chancre on the right ear was still hard, covered by a crust and exuding a milky pus. The inoculation on the left ear was covered by a brown crust, and rested on a circular induration. This scab was removed and by squeezing the wound a purulent bloody fluid was obtained; with this M. Robert inoculated himself again on the upper and back part of his left forearm.

We will trace the history of these two inoculations separately. But first it may be interesting to see what became of the inoculations on the cat's ears.

On the 22nd, the fourth day of the inoculation, the sore on the left ear was situated upon an accurately circumscribed induration. This was of the size of a split pea, red at its base, and covered by a thick crust, from beneath which a certain quantity of milky pus was expressed. When this scab was detached, a round ulcer was seen two lines in diameter, and bathed in pus. This pus was, in its turn, inoculated on the ear of another cat. On the third day this inoculation presented a pustule, terminating in a white point, very hard at its base, and surrounded by a red areola.

At this period, the first inoculation, which was done on the 16th (now the ninth day) appeared to be healing, and only presented a small hard granule covered by a crust. The inoculation of the 19th (on the sixth day) consisted of a very hard circumscribed kernel, covered with a crust. Beneath this was a round ulcer with sharp edges, covered with a milky pus.

On the 25th of August the inoculation of the 16th had healed; that of the 19th was hard and covered by a crust, but on the 28th it had become completely cicatrised. The remaining inoculations, which consisted of many more than I have mentioned, all healed from the eighth to the twelfth day, leaving always after them a little induration which gradually disappeared.

This induration is regarded by M. Auzias as a general consequence of these inoculations. But M. Maisonneuve and others believe that an indurated sore after the artificial inoculation of animals is the exception and not the rule. They say that M. Auzias has mistaken the thickening and condensation of the inflamed tissues for specific induration. To the consideration of this rather important point I shall again advert, only remarking at present, that during these experiments the animals appeared perfectly well, and were not affected, as far as could be ascertained, with any secondary symptoms.

I will now return to the inoculations which M. Robert practised upon himself from the pus derived from the ulcers produced by artificial inoculation on the monkey's ears.

On the third day, the first of these above the elbow was surrounded by a deep red circle, in the centre of which was a pustule as large as a pin's head. This was accompanied with very little swelling or pain.

The fourth day it presented a sore, a line in diameter, with sharp edges, covered by a thick pus of a yellowish colour and surrounded by a red areola. This was proved to be a real chancre, by the secretion from its surface being successfully inoculated on the ear of a cat.

The sixth day, the sore afforded an abundant secretion of pus and was increasing in size.

On the twenty-second day, it was the size of a half franc piece, presenting an irregular surface. The granulations were sometimes pale, and covered with matter which was very easily removed; sometimes red, and secreting a creamy and apparently healthy pus.

On the thirty-second day, healthy granulations appeared; and ten days later the sore was healing, presenting a raised cicatrix.

At the expiration of fifty-seven days, the sore had completely healed.

The second inoculation M. Robert practised, as I mentioned, on the upper and back part of his forearm. On the following day, there was a brown point surrounded by a red areola, darker coloured towards its centre, and slightly raised above the surface of the surrounding skin. The base of the inoculation was hard and infiltrated like an incipient boil. Upon the inner side of the elbow there was a dull pain increased by pressure. On a level with the painful part was a reddish line, arising from the red areola around the inoculation, and proceeding below the elbow to the front, and thence ascending parallel to the vessels and nerves along the inner side of the arm. This was accompanied by headache, want of appetite, and a fixed pain in the left shoulder.

M. Robert now abruptly gave up the idea of trying any more experiments with regard to syphilisation on himself. By the advice of some friends, he cauterised the second inoculation with the Vienna paste. In the evening, the eschar was surrounded by an extensive circle of inflammation. There was pain in the armpit with appreciable swelling, and the arm felt numb and tired. Towards the evening of the next day, a lymphatic gland immediately above the elbow became enlarged and very painful. The lymphatic vessel leaving its upper part could be traced by an inflammatory blush towards the axilla, in which there was a superficial enlargement, painful on pressure. The limb now became hot and heavy. Transient fits of shivering crept over the body, and the palms of the hands were dry and hot.

On the sixth day of the inoculation, and on the fifth of the cauterisation, there was an erysipelatous redness around the eschar, phlegmonous swelling of the forearm, sleeplessness, nervous pains in the head, pains and cold creepings over the limbs. The swelling of the gland on the inner side of the arm was increased, and there was pain on moving the shoulder.

The ninth day, the eschar made by the caustic separated, leaving an irregular ulcer with sharp edges and covered with a yellowish grey matter. The edge of this ulcer nearest the inflamed gland was undermined, and the whole presented

an unhealthy appearance. There was much pain and tenderness of the wound; the whole arm was œdematous, with darting pains in the axilla. Some matter taken from the surface of this wound was now successfully inoculated on the ear of one of the cats, showing that the poisonous character of the sore had not been destroyed by the caustic.

On the fourteenth day, an opening was made into the swelling on the inner part of the arm, and a quantity of well formed creamy pus evacuated.

On the fifteenth day, the inoculation was still painful. It presented a gangrenous and bleeding surface with a hard base, surrounded for some distance with œdematous infiltration.

On the twenty-first day, it had become less painful, but still presented a pultaceous and bleeding surface, with hardened and sharp edges.

On the thirty-first day, the surface of the ulcer was becoming cleaner and its edges less prominent: the œdema and swelling had disappeared, but the edges of the wound left by the suppurated gland were ulcerated, and had a syphilitic appearance.

On the forty-first day, this sore had again assumed a phagedenic surface. Its edges were undermined, inflamed, and very painful. The pus discharged was tinged with blood. The wound resulting from the open bubo was becoming clean, but its edges were undermined and sharp.

A fortnight after this, the surface of the sore again became healthy; and ten days later, the bubo began to cicatrise.

After lasting from the 21st of August to the 29th of October, the sore was all but healed, and the bubo resulting from it was completely cicatrised.

M. Robert had at this time regained his habitual health, and subsequently experienced no farther inconvenience. The cats also remained well and showed no indications of having had their constitutions affected, nor did they suffer from enlargement of the glands consequent upon the inoculations.

From his experiments, M. Robert arrives at the conclusion that—

The syphilitic virus inoculated upon the ears of cats determines a slight ulceration which exists for eight or ten days and secretes a purulent fluid.

When this pus is inoculated on the same or on another animal it occasions an ulceration exactly resembling the one

from which it was taken. When inoculated on man it gives rise to a chancre in the same way as if the syphilitic poison had been taken directly from man.

The ulceration in animals lasts on an average from eight to ten days.

It occasions in them neither inflammation of the absorbent nor secondary symptoms.

When several inoculations are made on the same animal, whether the pus be taken from the animal itself or from man, the last are neither more or less intense than the first. They all follow exactly the same course.

In this last respect, M. Robert's experience is at variance with that of M. Auzias Turenne.

LECTURE V.

ON SYPHILISATION AS APPLIED TO MAN.

In my former lectures, I mentioned that artificial inoculation gave rise, under different circumstances, to different classes of local affections. In the first of these, the symptoms were those of the adhesive inflammation. I mentioned that, in this class, the secretion from the inoculation consisted, during the first days, of a thin fluid, which gradually became more turbid; and that the parts in the immediate neighbourhood subsequently became indurated in a very peculiar and characteristic manner. In the second, the inoculated part at once ulcerated,* and, in general, produced a suppurating bubo. In the third, the inflammation terminated directly in suppuration of the part to which the poison was applied. Artificial inoculation on animals, we had reason to believe, did not produce the second of these kinds of local affections; but they did produce the first and the third. In man, artificial inoculation has comparatively rarely been known to produce the first, but seldom the second, and very frequently the third. The reason of this I presume to be, that the inoculations have in man almost always been performed upon those whose systems were already under the influence of the syphilitic poison, and that this circumstance has tended to modify the results of the experiments which have been performed.

The experiments on animals, originating with M. Auzias Turenne, excited little general attention until a memoir was read before the Royal Academy of Medicine and Surgery at Turin, by Dr. Sperino, on the 23rd of May, 1851. In this communication, Dr. Sperino announced that a vaccination had been discovered for syphilis as for small-pox, and intimated his belief that a prosecution of this

* In the second class of cases, when a part is said to ulcerate, it is not meant that there is simply a loss of substance. This is common to all sores, and may be produced in suppuration, by parts becoming dissolved or destroyed, and by other means. The term, as above used, is restricted to "ulcerative inflammation" of parts, in which, as the result of active inflammation, the surface of the sore becomes ragged and irregularly eaten away.

subject would bring to light the true method both of preventing and curing the disease.

Dr. Sperino mentions that he had long observed that the women committed to his care, who were the subjects of large primitive syphilitic ulcers, or who were affected with phagedenic or gangrenous sores, rarely became affected with constitutional syphilis; and that the patients who returned to the *Syphilicome* several times with primary affections were comparatively seldom attacked by any secondary disease: but that the patients who came from the country, and who had for the first time a chancre, were generally thus affected at the end of three or four months. Again, he observed, that patients who presented themselves with open virulent buboes, and in whom several inoculations were made, not only soon recovered from their local disease, but did not subsequently suffer from constitutional affections.

From these and other observations, he was led to believe that secondary symptoms do not manifest themselves in direct relation to the extent and number of the primary ulcers, but, on the contrary, that constitutional syphilis presents itself in inverse proportion to the number of these ulcerations.

On the 18th of November, 1850, M. Auzias Turenne announced to the Academy of Sciences at Paris that, after having inoculated the primitive ulcer several times on animals, and especially on monkeys, he had constantly observed that the first ulcer showed itself more quickly than the following. He found also that it became larger, secreted more pus, was accompanied by more active inflammation, and lasted longer than the second. He concluded that the third inoculated ulcer bore the same relation to the second as the second did to the first, and so on until the animal became proof against any further inoculation. The animal was then said by M. Auzias to be "syphilised". This announcement appeared to Dr. Sperino to shed a great light upon the subject, and especially to illustrate the observations which he had previously made. He was especially struck with the analogy which appeared to him to exist between the experiments of M. Auzias and that which he had observed with regard to those patients who had contracted several sores in succession, and at short intervals of time.

But the supposed facts appeared still of little value, so long as the experiments upon which they were founded

were confined to animals. Dr. Sperino therefore set about applying the "marvellous facts", as he calls them, brought to light by M. Auzias's experiments upon animals, in good earnest, to the treatment of human beings. During five months, he subjected, in presence of several of his colleagues, fifty-two patients affected with syphilis to this mode of treatment.

The inoculation in these cases was always made with a lancet, three or four separate punctures being made each time, generally upon the abdomen. The inoculation was repeated once or twice a week, and the punctures were always covered, so as to retain the inoculated matter in contact with the part. The pus was always taken from a chancre during its period of progress. On the third, and rarely on the fourth day of the inoculation, the syphilitic pustules showed themselves, and immediately afterwards appeared the primitive chancre, with all its characteristics. In all the cases, without exception, Dr. Sperino found that the first artificial ulcers became larger than the second; they secreted a larger quantity of pus, lasted longer, and left after them larger cicatrices than those which followed.

The second ulcerations were smaller, less inflamed, less painful, more superficial, than the first; the third than the second; and so on until, after a certain number of inoculations, in general from eight to ten (three chancres being produced each time), it was only possible to produce a little pustule, which disappeared spontaneously in five or six days. After that, other inoculations remained without any result, although the pus was taken from fresh persons affected with recent sores. This same pus, inoculated upon other patients, never failed to produce its characteristic ulceration.

In patients who had already large and old ulcerations (and who, Dr. Sperino believes, were already in a measure saturated with syphilitic virus), the first artificial ulcerations were small, and it was not possible to reproduce them after a few inoculations.

Arrived at this point, Dr. Sperino believed his patients syphilised, that is, incapable of further syphilitic contagion, as M. Auzias believed the animals to be upon which he had made his experiments.

"It is certain", says Dr. Sperino, "that of all the women who entered five months ago into the *Syphilicome*, and whom I syphilised to the highest degree, not only have none

hitherto been affected with constitutional symptoms, but the health of each of them has gradually improved since the active stage of the first artificial ulceration, to the end of the experiments to which they were subjected."

It is true that this account differs somewhat from that which Dr. Sperino subsequently gives in his book published at a later period. In this work, it is said that, out of fifty-two patients affected with primary syphilis, the plan of treatment by repeated inoculation was successful in fifty, and unsuccessful in two; out of forty-three patients affected with constitutional syphilis, twenty-six were treated by syphilisation, and twenty-five were cured. In six instances, the iodide of potassium was used in conjunction with syphilisation; and in eight cases, syphilisation, iodide of potassium, and mercury, were all employed. In three cases, it was found necessary to discontinue the inoculations, and two patients died.

This rate of mortality appears very high; for in this country, where the disease presents itself under perhaps severer forms than in any other, we very seldom have to register a death from syphilis alone.

Of fifty-three patients treated for primary syphilis, only three are reported to have presented themselves, at the time the book was written, with secondary affections; but it has since been said that others subsequently made their appearance, and were again admitted into the hospital for secondary symptoms.

The patients who presented themselves for secondary disease were again treated (cured, it is said) by fresh syphilitic inoculation.

The facts given by Dr. Sperino bear upon the face of them the evidence of having been collected by a very enthusiastic observer; but, even supposing them to be all true, yet the length of time occupied in the treatment does not appear very encouraging.

Excluding the cases treated with mercury, and the cases in which the treatment was interrupted, Dr. Sperino gives us seventy-six cases in which the supposed immunity against the effects of syphilis produced by repeated inoculations might be observed. Of these, the effect is said to have been produced in less than a month in one case; in from one to three months in four cases; in from three to six months in seven; in from six to eight months in eight; in from nine to twelve months in eight; in from twelve to

fifteen months in twenty-one; and in from fifteen to seventeen months in twenty-seven. Thus we see that there is a gradually increasing number of cases requiring a corresponding increased length of time for their so called syphilisation: and is it difficult to imagine why, if so large a number as twenty-seven remained unsyphilised after fifteen months, none should remain in the same condition after seventeen months, and why that there should have been no recurrence of the disease after this period.

The mode of treatment pursued by Dr. Sperino, and its effects, may be illustrated by the following cases.

Case I. A. C., sixteen years of age, of good constitution, was admitted into the hospital on the 9th of May, 1851. She then had an indurated syphilitic ulcer on the internal and lower part of the right labium, and two other non-indurated sores at the orifice of the vagina. She was now affected for the second time, and had been ill a fortnight. Four months previously she had taken a hundred and twenty pills for a primary syphilitic affection, said to consist of an indurated sore.

On the 12th of May, after having administered purgatives and ordered a bath, Dr. Sperino inoculated three points on the right hypochondriac region with the matter taken from a primitive indurated sore. There arose on these points three little vesicles, which, on the third day, were converted into pustules, surrounded by an inflammatory blush.

May 15th. Three inoculations were made with the same pus, and three pustules were produced.

May 22nd. Three fresh inoculations were made with pus taken from a fresh patient.

May 26th. Only one of the last three inoculations had produced a pustule.

May 29th. The inoculations were again repeated, and produced three pustules. The ulcers produced by the inoculations first made were larger than those resulting from the second operation, and these were again larger than those subsequently formed.

June 3rd. Three fresh inoculations were made with a positive result. The primary ulcer for which the patient was being treated had healed, but the induration remained.

June 7th. From this day to the 1st of July sixteen punctures were made, at seven different times, with pus derived from sores of other patients in a state of progress. Only four abortive pustules showed themselves as the

results of these sixteen inoculations. The ulcers arising from the inoculation of the 22nd, 26th, and 29th of May, and the 3rd of June, did not become large, and were healed towards the end of June, at the same time as the sores produced by the first inoculations on the 12th of May. The induration, which had existed after the cicatrisation of the ulcer on the right labium, gradually disappeared; at the beginning of July there was no longer any trace of it.

July 2nd. Two inoculations were performed, and were followed by two pustules.

July 3rd. Three similar inoculations were followed by the same positive result.

From the 9th to the 21st of July, eighteen punctures were made, at five different sittings, all of which were followed by little pustules having a characteristic appearance. These, however, healed in a short time (from eight to ten days), and left scarcely a trace of their existence.

July 26th. Three inoculations were made with the pus derived from the inoculations of the 3rd of July. Three pustules resulted, smaller than the preceding.

July 27th. Eight inoculations were made; and four more on the 30th.

August 4th. Twelve small pustules appeared. The sores resulting from the inoculations of the 2nd and 3rd of July were already dry and cicatrised.

From the 4th to the 22nd of August twenty inoculations were made with well chosen pus. Six little pustules resulted, which were healed in five or six days.

This patient was kept in the hospital until the 13th of September, when she was allowed to depart, after having remained in the hospital for four months and four days, and been inoculated eighty-nine times.

No constitutional symptoms, it is said, showed themselves in this case, and the patient left in perfect health. Six cicatrices on the hypochondriac regions were the most visible; the others, although numerous enough, were small: they all were gradually becoming fainter. This patient was considered almost syphilised.

Case II. A. B., aged 16, was admitted into the *Syphilicome* on the 1st of August, 1851, affected with a primary syphilitic ulceration on the anterior lip of the neck of the womb. There had been no previous disease.

August 3rd. The pus from the ulcer on the neck of the

womb was inoculated in two places on the right hypochondriac region.

August 4th. The points where the pus was inserted were slightly red.

August 5th. A little vesicle had appeared upon each.

August 6th. The syphilitic pustule had appeared at the two points; there was some fever.

August 7th. The fever had increased; the pustules broke, and exposed primary syphilitic ulcerations; the base of these began to feel slightly indurated.

August 8th. The pus from the last named pustules was inoculated on the corresponding point on the left side in two places.

August 11th. Two pustules had appeared in the situation of the last inoculations. The two first artificial ulcerations continued to increase: they were indurated, and presented all the characteristics of the Hunterian chancre.

August 13th. The pustules arising from the inoculations made on the 8th had been open for the last two days; the sores left were smaller, less inflamed, less hard, and less painful than the first.

August 15th. Seven inoculations were made, with the pus from the first artificial sores, under the right breast.

August 18th. Seven little pustules had resulted from the last inoculations.

August 21st. The ulcers from the inoculations made on the 15th were smaller and less painful than those made on the 8th. Eight fresh inoculations were performed with the pus derived from the second series of artificial sores.

August 24th. Eight pustules had resulted from the last-named inoculations; but these ulcers were small, and surrounded by a faint inflammatory areola. The first and the second series of inoculations were beginning to heal; the other were small, and remained stationary. Six fresh inoculations were made with some virulent pus taken from another patient.

August 31st. Three out of the four sores produced by the first inoculations were cicatrising; the fourth was also healing. Those resulting from the inoculations performed on the 24th were beginning to dry up. Twenty punctures were now made with a lancet charged with virulent matter from a fresh patient.

Sept. 2nd. Twenty little pustules, but slightly inflamed,

had resulted from the last inoculations; nineteen similar punctures were made on the left side of the chest.

Sept. 18th. The ulcers resulting from the inoculations performed on the 31st of August, and on the 2nd of September, had gradually diminished in extent, and had cicatrised. Fifteen inoculations on the right side of the chest were performed, and on the 20th six more.

Sept. 22nd. The inoculations of the 18th and 22nd had given rise to small abortive pustules. Five fresh punctures were made.

Oct. 2nd. The pustules from the inoculations practised on Sept. 18th and 20th had not burst, but had dried up; the inoculations of Sept. 22nd had remained without result.

Oct. 13th. There were no longer any traces of pustules. The induration of the first artificial ulcers had entirely disappeared. During this plan of treatment no internal medicine was given, with the exception of some refrigerating drinks when the skin was hot, or the pulse frequent.

During the period of the first inoculations some slight fever was present. In other respects this patient enjoyed excellent health. The cicatrices had almost entirely lost their coppery hue when she left the hospital on the 13th of October.

It is inferred in this case, that the fever observed on the 6th and 7th of August may have been the syphilitic fever, or that fever which precedes the syphilitic eruption; and therefore that such an eruption might have been expected had not the syphilitic inoculations been made.

Case III. C. B., aged 16, was admitted into the hospital on the 20th of March, 1851, with two large primary ulcers, open for ten or fifteen days, and for two buboes, in which evident fluctuation could be detected. This patient was diseased for the third time, but had only once been treated with mercury: she then used forty frictions, and took fifty-six pills of proto-iodide of mercury.

March 31st. Two inoculations were made on the abdomen, and two pustules were produced; on the 7th, the 10th, the 14th, and the 17th of April two inoculations were performed, followed each time by ulcers smaller than the preceding. All the ulcers remained superficial and small.

April 28th. The ulcers resulting from the above inoculations were almost all cicatrised. Three fresh inoculations

were made on the abdomen, and three more on the following day. These were all followed by little pustules.

May 8th. Three inoculations on the abdomen were not followed with any result. The two buboes had become indolent, smaller, and fluctuation could no longer be felt in them.

On the 15th, 19th, 22nd, and 29th of May, and on the 4th of June, divers inoculations were performed which gave rise to little pustules. The primary ulcers for which she was admitted had recently become cicatrised, and the artificial ulcers were healed.

From the 7th of June to the 19th of July, thirty-five inoculations were performed at short intervals. From these, sometimes no result at all was produced; sometimes nothing but little pustules produced by the puncture, and which healed in four or five days without leaving behind them any marks of their existence. But on the 19th of July an inoculation gave rise to a little pustule, the scab of which being raised on the 24th, left a small ulcer having the characters of a syphilitic sore; on the 30th of the same month this sore was entirely healed.

From the 19th to the 31st of July, twenty fresh inoculations were made without any positive result.

On the 17th of August, this patient left the Hospital, having resided there four months and twenty days, and having enjoyed uninterrupted good health during the whole of that time.

It is to be observed, regarding this case, that no information is given with regard to the sources whence the inoculated pus was derived, and that, if left to itself, it is not a case in which secondary symptoms might have been expected. But the inference deduced from it is, that syphilisation among other wonderful properties has that of producing absorption of matter from a suppurating bubo.

The advocates of this plan of treatment insist that repeated and successive syphilitic inoculations carried to saturation induce not only an immunity against the infection of this same virus, but that they serve to cure the different syphilitic symptoms primary as well as secondary.

This point, it might be said, is illustrated in the following case, reported by M. Zelaschi.

Case iv. Charles T., aged 29, contracted a syphilitic ulcer in November 1850, which left an induration in May 1851. At this time, he again contracted a primary syphilitic

sore on the mucous membrane of the upper part of the prepuce.

June 22nd. The treatment by syphilisation was commenced with two punctures on the right thigh with a lancet charged with the discharge from the primary sore upon the prepuce.

June 25th. Two little pustules had made their appearance. Two fresh inoculations were performed, and *two days* afterwards were succeeded by two pustules.

June 27th. The patient complained of pain in the left groin, where an enlargement was discovered of the size of a pigeon's egg. Three fresh inoculations were made on the left thigh, and gave rise to three pustules.

July 1st. Three inoculations with the pus derived from the artificial sores gave rise on the third day to the same number of pustules.

The ulcers produced by the two first inoculations were very painful. The primary ulcer on the prepuce continued to increase.

July 5th. Two inoculations were made on the right thigh; three on the left.

July 8th. Four more inoculations were made on the left near the last mentioned. All these were followed *from the second to the third day* with characteristic pustules. The matter from a blennorrhagia, with which the patient was also affected, was now inoculated, but produced no effect.

July 10th. The ulcers from the first inoculations were very painful, and secreted a great deal of virulent pus. The ulcers produced by the subsequent inoculations were of smaller extent that those produced by the first.

The bubo was stationary and indolent. The primary ulcer on the prepuce had continued to increase. It was of a brick red colour, much inflamed, and had destroyed a considerable portion of the prepuce. The inoculations were now interrupted.

July 21st. Some symptoms of fever had existed since the last report, for which the patient was bled.

July 29th. The primary ulcer on the prepuce, and the sores resulting from the inoculations, were less inflamed. The ulcerations produced by the first inoculations appeared to be still poisonous; all the rest were healing. The sores produced by the fifth, sixth, and seventh series of inoculations were almost cicatrised. The swelling in the groin had well nigh disappeared.

August 4th. The ulcers produced by the last three series of inoculatious were healed, and the others under healiug on thc 14th of August. Thirty-five days after the inoculations wcrc discontinucd, somc constitutional symptoms appeared—on the baek and thighs and other portious of thc body slightly raised patehes of a coppery colour were visiblc —and on thc 18th and 19th the patient was affeeted with periosteal pain of the tibia. The primary ulcer had now destroyed the upper half of the prepuee, and eaten away part of the corona glandis. The eutaneous spots were beeoming confluent.

In this rather uninviting state of things, M. Zelasehi bethought himself of again having rceourse to syphilisation, but before doing so sought the advieę of Dr. Sperino with reference to the case. It was theu agreed that syphilisation should again be had recourse to, and that it should be vigorously proseeuted.

Aecordingly, on the 20th of August, twenty puneturcs were made with pus derived from other syphilitie patients, and twenty pustules wcre produeed.

August 23rd. Fourteen puueturcs were made with a laneet eharged with pus takeu from the sore on the patient's prepuee, and twelve pustules resulted.

August 30th. The general state of the patient was described as very satisfaetory. The primary uleer on the prepuee was no longer extending itself. The uleers arising from the inoculations of the 20th, were inflamed and painful. Fifteen fresh punetures gavc rise to elevcu pustules.

August 31st. The pain of the tibia was now seareely perceived by the patient. The eruptious had not progressed. The uleers from thc inoculations performed on the 20th, were healing.

Twenty inoeulations were now made with the pus taken from the sorcs resulting from the punetures of the 23rd. Eighteen little pustules resulted.

Sept. 6th. The ulcers produced by thc inoculations of the 20th and 23rd of August were dried up.

Five frcsh inoculations with pus derived from frcsh patients gave rise to five pustules.

Scpt. 12th. Ninc inoculations with thc pus derived from the sorcs produced on the 6th. Thesc gavc rise to littlc pustulcs. With the same matter on thc 15th, six inoculations afforded no result.

Scpt. 20th. Twenty inoculations with pus derivcd from

fresh sources. Seventeen pustules resulted, which had dried up on the 29th without having burst, with the exception of two, which still remained moist.

From the 25th of Sept. to the 1st of Oct., fifteen inoculations were made; no result showed itself from these.

Oct. 8th. Eight inoculations: three little pustules resulted, of the size of the head of a pin, which dried up in less than three days, without having been broken.

Oct. 9th. Nearly all the syphilitic spots had disappeared, an abundant desquamation covered the whole body, and especially the regions were the spots had been the most confluent.

Oct. 11th. Six punctures were made; and on the 19th ten more. These presented no results. The matter for the inoculations of the 25th of Sept. and the 19th of Oct. was taken from indurated sores in a state of progress in other patients. This virus was proved to be eminently active when tried in other cases.

All the syphilitic symptoms, both primary and secondary, had now disappeared, and the patient resumed his ordinary occupation.

LECTURE VI.

SYPHILISATION (CONCLUDED).

In the examples of artificial inoculation which we have hitherto considered, suppuration of the inoculated points has been a very general and marked result. In different cases we have found that this action has taken a greater or less time to develope itself, but that the inflammation produced by the artificial inoculations has generally been, from the first, of the suppurative character. In these cases, so far as we have yet seen, no additional constitutional effects have followed the artificial inoculations. In this respect, the cases have afforded examples of the law which I dwelt upon in a former lecture; viz., that when a sore from the first suppurated (whether it was induced by artificial or by natural inoculation), no constitutional symptoms would be likely to result.

Suppuration, in general, is produced with great difficulty in animals. It is not easy by any simple lesion to produce in them a discharge of well-formed pus. The readiness with which this action is induced in artificial syphilitic inoculation at once tends to support the idea that animals are susceptible of the specific influence of this morbid poison, and to indicate the mode in which nature in them eliminates the virus when artificially introduced into a part. The distinct and characteristic morbid action to which the syphilitic poison has been shown to give rise in animals, appears to me to contradict the idea which has been maintained by some, that the virus may simply remain dormant in the inoculated part (being diluted and mixed with any secretions with which it may come in contact); and that, when in this diluted state it is again reinoculated upon man, it may again resume its peculiar activity. Such an idea, I say, appears to me to be inconsistent with the distinct morbid action which is induced by artificial syphilitic inoculation of animals, and the spots of suppuration in them which are thereby induced. The pustules in the cases before recorded were found to have been formed sometimes in two and very generally in three days; and although in the last

series of inoculations performed in any case, very little inflammation of any kind appears often to have been produced, yet that which did exist was of the suppurative character. This circumstance renders it extremely probable that the induration which was felt at the base of these artificial inoculations arose from the general infiltration of surrounding tissue which usually accompanies suppurative inflammation, and not upon any peculiar and specific adhesive inflammation of the inoculated part.

Attempts to induce the state called "syphilisation" have not been so successful in France as in Italy. For although it has been found that patients gradually become less and less susceptible to the influence of the specific matter derived by successive formations of pustules on themselves from the same original source, yet it has been shown that these same patients might generally be inoculated as at the commencement, when the pus was derived from a fresh patient.

The following cases are recorded by Dr. Thiry of Brussels:

Case. A patient, who had had a variety of primary and secondary syphilitic affections and had been subject to antisyphilitic treatment for an indurated sore, was admitted into St. Peter's Hospital on the 4th of October, 1851. Several primary ulcerations existed at this time.

Oct. 7th. Three inoculations were made upon the abdomen from one of the primary sores. In twenty-four hours, each presented the characteristic pustule and areola.

Oct. 8th. Three inoculations were made as before.

Oct. 9th. Three inoculations were made with the pus derived from the first inoculations.

Oct. 10th. Three inoculations were made with the pus produced by the inoculations of the 7th. These had not increased in size, and were covered by a crust, which, when raised, allowed the escape of a considerable quantity of virulent pus. The inoculations made on the 9th had succeeded.

Oct. 11th. Three fresh inoculations were performed with the pus of the chancres inoculated on the 8th.

Oct. 12th. Three areolar pustules had followed the inoculations of the previous day. The pustules produced by the inoculations of the 10th showed a tendency to fade. Under each pustule there was some thickening of the cellular tissue, but not the least sign of specific induration.

Oct. 13th. The different inoculations, after having somewhat enlarged, faded away, and presented the starred appearance of some cicatrices.

Three inoculations were repeated on the 14th and 15th respectively. The latter became less developed than the former.

Oct. 16th. Three inoculations were made with the pus of the chancres inoculated the day before.

Oct. 17th. The inoculations of the 16th had succeeded, but in a very slight degree. Three fresh inoculations, made with the secretion of the most active sores, were followed with positive results.

The inoculations were continued on the 18th, 20th, 21st, and 22nd.

Oct. 23rd. The last inoculations had now only produced a slight papular elevation, having no characteristic appearance.

Oct. 24th. Three fresh inoculations were made with such remains of purulent matter as could be collected from the different sores; one only of these inoculations gave rise to a papular elevation similar to those before mentioned; the other inoculations furnished no result.

Three similar inoculations on the 25th, ended in a papular elevation still less marked.

On the 26th, 27th, 28th, and 29th, all the inoculations became cicatrised without induration. Some further attempts were made to inoculate this patient from the secretions of her own sores, but in vain; nothing further was produced. But, on the 1st of November, this same patient was inoculated with the matter taken from the sores of another woman, who had also been subject to this treatment by syphilisation.

Nov. 2nd. The inoculation had succeeded; a vesicular pustule had appeared, surrounded by a red areola, faint, it is true, but still characteristic. This vesicular pustule contained a sero-purulent fluid, which was again inoculated, and again produced its specific effects. Another series of inoculations was now again commenced from this fresh source of infection, and the inoculations all succeeded as at the first. At length, after fifty-seven inoculations in all had been practised, the experiment was given up.

The inoculated sores were healed as soon as possible, and the patient left the hospital in the beginning of December.

In a second case, the attempt to induce syphilisation was given up after sixty-three inoculations had been made, all of which succeeded; and in a third case, after twenty-five artificial ulcers had been produced.

Such cases furnish a sufficient refutation of the idea that the state known or imagined as syphilisation can be, at will, artificially produced; yet have we, on the other hand, direct evidence that individuals and even nations, from artificial or natural causes, become susceptible to the influence of the syphilitic poison in extremely different degrees: and we have conclusive testimony, as I believe, that the repeated inoculation of syphilitic matter whether by artificial or natural means, tends powerfully to produce such a modification of the effects of the poison.

In the first place it must, I think, be admitted that, as a rule, syphilitic matter derived from the same original source gradually loses its influence after successive inoculations. Exceptions may occur to this as to every other rule, but as far as the evidence upon this point has hitherto gone, it tends to prove that the poison derived from the same source gradually loses its effect when successively applied to different parts of the same patient. Some of you had an opportunity of observing the following case, for the notes of which I am indebted to Mr. Grylls, our late house-surgeon.

Case. H. C., aged 21, came under treatment on the 2nd of February, 1854. She had then a syphilitic eruption of eleven weeks duration. There were several chancres about the inferior commissure, anus, and inner margins of both labia. The inguinal glands were slightly enlarged and indurated, and there was enlargement of the right nympha with vaginal discharge.

February 4th. Several spots were inoculated on the right natis, from the angry looking sores on the margin of the anus and labia.

February 6th. Several fresh spots were inoculated on the left natis, from other angry looking sores.

February 11th. Each point inoculated produced a small pustule: several fresh inoculations were made with the pus of the original sores and of the artificial inoculations.

February 13th. Upon each last inoculated point a vesicle had appeared.

February 14th. Each vesicle had become pustular.

February 16th. The left natis was now inoculated in several spots from the sores, both natural and artificial, which furnished the largest amount of secretion. Eighteen hours afterwards, the inoculated spots were found to be slightly reddened.

February 18th. Forty-four hours after the inoculation, no effect was perceptible. Several fresh spots were inoculated with the pus of the sores near the anus and from those artificially produced, on the inner side of the right natis.

February 23rd. The last inoculations had produced no effect. The inoculations of the 11th were forming small dry scabs. The eruption had now faded.

February 24th. Several spots were inoculated over the sacrum with as much remaining secretion as could be obtained from any of the sores.

February 27th. The inoculations of the 24th had taken no effect.

February 28th. All the inoculated and other primary sores had healed, without leaving any induration.

This patient was considered to have recovered on the 2nd of March, having been under treatment exactly four weeks, and having during the last two weeks been apparently insusceptible of any farther inoculation by means of the secretion derived from her own sores.

It is probable that, in this case, if the matter had been taken from a fresh patient, the inoculations would have succeeded. But this experiment was not considered either necessary or justifiable. The treatment adopted consisted of the compound steel pill, and of some saline medicine at a time when there were some slight feverish symptoms.

It may be remarked, with regard to this case, that the eruption had persisted for some weeks before the patient came under observation, and that it would probably have faded in something like the same time, had she not been subject to any treatment at all.

The length of time that this patient had been diseased will also probably account for the little susceptibility she shewed to any farther infection.

The results obtained by experiments agree in this respect with those derived from the observation of the natural course of the disease. It will constantly happen, that persons habitually exposed to contagion or those who have long suffered from syphilitic disease, will at length become little liable to any fresh syphilitic influence from natural causes.

There are some who enjoy a comparative immunity from syphilitic infection. What the conditions are which confer this peculiarity have not been satisfactorily ascertained. But there can be no doubt that, while in some individuals

it is found to exist naturally, that in others it may, for a time at least, be acquired.

This peculiarity is found to exist, not only among individuals but also among large classes of people, and even to extend to nations. In nations, as in individuals, this comparative immunity may be natural. In both it may in some degree be acquired. Whoever will take the trouble to look over the hospitals in France, and compare the cases there seen with those treated in the hospitals in England, will be struck with the mildness of the symptoms in the former as compared with the latter. Yet there have been periods in the history of the disease in which the French have suffered most severely. Now, however, it appears by successive transmission to have become so modified as scarcely to appear to be the same affection. Some French authors, and among others MM. Maisonneuve and Montanier, have supposed that a diseased parent has transmitted the immunity which he had acquired in some measure to his offspring; and that thus, through a series of transmissions, the disease has generally become modified for the whole nation.

It must be admitted that any animal poison may become more or less active in its operation, from various causes quite independent of any peculiarity in the constitution of those affected. But a greater or less activity of the poison itself will certainly not account for the facts which have been noticed regarding syphilitic infection. It is well known that individuals exposing themselves to the same source of disease will often be very differently affected: the same thing is true with regard to nations. In the year 1812, it was noticed by Dr. Fergusson that the British army suffered most severely during the four years that it had then been in Portugal, while the inhabitants of the country had the disease in very mild forms. They were "cured by topical remedies alone, and," says Dr. Fergusson, "I have lived long enough among them to ascertain, that their return to hospital under such circumstances for secondary symptoms is far from an universal, or even a frequent occurrence. The venereal lists amount to forty-six, and two of them only are taking mercury. None of the ulcers are such trifling cases of chancre as we have seen at home; nor even such as an English soldier would run with in affright to seek the succour of his surgeon. To these, the Portuguese soldier pays no attention whatever; he does not consider them to be a hindrance to him in any manner, and I have seen him

turn out for duty with ulcers that made me shudder to look at, though both he and his medical attendant considered them as nothing."

While the native soldiers were thus treated by topical remedies alone, and seldom had any constitutional symptoms, the British often "sustained the most melancholy of all mutilations," and the venereal ulcerations in them were not only "found more intractable to the operation of mercury than under similar circumstances at home"; but the constitution, while under the influence of the remedy, became affected with the secondary symptoms in a proportion that could not have been expected. Such were the very different results in the two classes of persons infected from the same sources. In the one, whose constitutions appeared to have become familiarised with the disease, it produced, as a rule, only its local effects; in the other, who did not enjoy the same unenviable privilege, not only were the local affections more severe, but the system became often affected, and that in spite of appropriate medical treatment.

From such considerations, it will at once appear how fallacious any conclusions are likely to be that are derived exclusively from the observation of patients who have long been subject to disease either in its direct or hereditary forms. Any data derived from venereal hospitals, unless care be taken in the selection of the cases, may from this cause prove utterly valueless when applied to cases met with in private practice; and especially are the facts furnished by any particular class of persons liable to mislead, if inadvertently applied to another class, placed in a different position. Thus, from observations made in the army, Mr. Rose, in the year 1817, published a paper on the treatment of syphilis, with an account of several cases of that disease in which a cure was effected without mercury; and, from his experience among soldiers, he was led to believe that he might adopt the same means of treatment in private practice. But we have it recorded upon the authority of Sir B. Brodie, that here it was unsuccessful, and that Mr. Rose was at last induced again to have recourse to mercury in the treatment of syphilitic affections in private. Since Mr. Rose's publication, many other army surgeons have adopted the non-mercurial plan of treatment, and have continued it up to the present time. This they certainly would not have done, had they not found it successful. But it must be remembered

that the cases which they have to do with occur in those who are often in some measure syphilised. The patients whom they see have comparatively rarely the disease for the first time; their systems have in some measure become accustomed to the influence of the poison, and the forms both of primary and secondary disease in them are most materially modified thereby. A person who has repeatedly contracted primary syphilis is in some measure placed under the same circumstances as a patient who has been repeatedly inoculated artificially; and we possess sufficient evidence, derived both from observation and experiment, to show that, under such circumstances, the local disease is altered in its characters, and that no additional constitutional affection is likely to be indueed.

The modification of the action of the syphilitic poison, in consequence of repeated inoculation, although it has of late years assumed a new name, is not, as we have already seen, a new subject. The conclusion to which Dr. Fergusson arrived in the year 1812 was, that the disease had become so much mitigated in Portugal, by reason of general diffusion or other causes, that, after running a mild course, it exhausted itself, and ceased spontaneously. Dr. Fergusson further mentions, that at that time, he had reason to believe that in other countries the disease became modified in a similar way; that in certain German regiments, and in some districts of the Russian empire, the medical attendants had found that mercury was not necessary for the treatment of syphilis; and that, in the patients to whom he referred, the disease, from being allowed to run its course probably for ages, had become as weak as it was found to be in the Portuguese.

The conclusion arrived at by Dr. Fergusson is remarkable, as furnishing a means of accounting for what he had himself observed, and as having been revived and adopted to account for the more extended series of observations and experiments of the present day.

All adventitious diseases, he says, that are not connate, endemic, and sporadic, appear more or less to run this course of exhausting themselves while retained upon the same ground to which they have been transplanted. But let the field be changed, and fresh sources of development be presented, they instantly resume their primary powers, and, taking a fresh departure of violence, repeat the almost forgotten inflictions of their original visitation. The powers

which they thus acquire bear some resemblance to a phenomenon which is every where observable in the vegetable kingdom. The same species of seed may be sown upon the same ground until it shall so degenerate in point of vigour as to become almost incapable of reproducing itself; but let it be changed to any other of any kind, though even of far inferior quality, it will immediately display new powers of life, and fructify and vegetate with its native strength. Similar to the above appears to be the inoculation of the exhausted syphilitic virus of Portugal (though evidently the same disease) into the constitution of the British or other stranger. It is in some measure new, therefore unfriendly; and seems to have the power of exciting new actions of more than ordinary violence.

The Portuguese, through apathy, and at a dreadful price levied on the generations that are passed, and never, in all probability, to be redeemed by their descendants, appear to have gained a great exemption from both syphilis and variola; but the price is too high for us ever to offer up our bodies to be the unresisting subjects of disease, the fatal consequences of which, though they might go far to extinguish one or two ills, would be felt in the deterioration of our race to the most distant ages.

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